Southern Minnesota Medical Association Meeting, Fairmont, June 28-29, 1920.

VOLUME III NUMBER 6

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association

EDITOR

CARL B. DRAKE, M. D., St. Paul

ASSISTANT EDITORS

STANLEY R. MAXEINER, M. D., Minneapolis PAUL D. BERRISFORD, M. D., St. Paul

ASSOCIATE EDITORS

First District
GEO. S. WATTAM, M. D., Warren

Second District
A. W. IDE, M. D., Brainerd

Third District
E. L. TUOHY, M. D., Duluth

Fourth District
F. L. ADAIR, M. D., Minneapolis

Fifth District
GEO. B. WEISER, M. D. New Ulm

Sixth District
A. E. SPALDING, M. D., Luverne

Seventh District
H. B. AITKENS, M. D., Le Sueur Center

Eighth District
A. F. SCHMITT, M. D., Mankato

JUNE, 1920

CONTENTS

ORIGINAL ARTICLES

JAS. S. GILFILLAN, M. D.—The Diagnosis of Cardiac Disease 269
FRANK S. BISSELL, M. D.—Radium-X-Ray Therapy of Carcinoma Uteri and Uterine Bleeding 273
W. A. PLUMMER, M. D., and A. C. BRODERS, M. D.—Tuberculosis of the Thyroid 279
ERNEST Z. WANOUS, M. D.—The Uterus at the Menopause 283
W. A. COVENTRY, M. D.—Prolapse of the Uterus 286
J. A. WATSON, M. D.—Vertigo—Its Causes and Their Determination 290
A. F. TYLER, M. D.—Injection of Gas Into the Peritoneal Cavity for Diagnostic and Therapeutic Purposes 295
C. ROBERT MULLONG, M. D.—Blood Transfusion and the Result That May Be Expected 298

(Continued on Advertising Page III.)

Owned and Published Monthly by

THE MINNESOTA STATE MEDICAL ASSOCIATION

BUSINESS MANAGER

J. R. BRUCE, 403 Central Bank Bldg., Saint Paul

Telephone: N.W. Cedar 1683

Entered at the Post Office in Saint Paul as second class mail matter.
Accepted for mailing at the special rate of postage provided for in section 1103, act of October 3, 1917, authorized July 13, 1918.

Subscription Price { $3.00 yearly, Domestic
$3.50 yearly, Foreign

NOTICE

IN view of the fact that the raw material used in manufacturing of PYOKTANIN CATGUT has advanced so considerably in price, we find it absolutely necessary to make an advance in the price of the finished product. We have refrained from doing this as long as possible. The Ramsey County Medical Society has exclusive control of the manufacture of this Catgut—no outside capital being invested. Any profits made are all for the benefit of the medical profession. We trust you will realize the necessity of our doing this and will continue to give us your valued patronage.

PRICE LIST OF PLAIN AND FORMALIZED

PYOKTANIN CATGUT

Manufactured by

The Laboratory of the Ramsey County Medical Society
LOWRY BUILDING
ST. PAUL, MINN.

	Per Dozen Strands
Size OO—14 inches	$0.85
Size O—14 inches	1.00
Size 1—14 inches	1.20
Size 2—14 inches	1.35
Size 3—14 inches	1.50
Size 4—14 inches	1.60
Size OO—28 inches	$1.20
Size O—28 inches	1.40
Size 1—28 inches	1.60
Size 2—28 inches	1.80
Size 3—28 inches	2.00
Size 4—28 inches	2.20

Special Discount to Hospitals and to the Trade. **Cash must accompan y the Order**

ADDRESS:

Laboratory Ramsey County Medical Society
Lowry Building, Saint Paul, Minnesota

For Sale by all Druggists

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association

VOL. III JUNE, 1920 No. 6

ORIGINAL ARTICLES

THE DIAGNOSIS OF CARDIAC DISEASE*

By JAS. S. GILFILLAN, M. D.
St. Paul, Minn.

The reason for presenting to you today a paper which you will find contains nothing new, is that even today the subject of abnormal sounds heard over the cardiac region appears too seldom to be the subject of critical study. How often we see patients in whom the discovery of an accidental murmur has lead to the diagnosis of chronic endocarditis, and, as this is especially apt to occur during childhood, activity has been limited and perhaps a chosen vocation abandoned for fear of overtaxing a crippled heart. How frequently men have been unable to obtain life insurance or have been rejected during examination for the army when the murmur heard over the heart had really no significance.

It may repay us first to review briefly the physics of murmurs. Much has been written on this subject, but so long ago that it has been almost forgotten.

The acoustic peculiarities of cardiac murmurs correspond completely to those sounds which can be produced by the flow of fluids in tubes. If water flows through a glass tube, there is no sound until a certain rapidity of flow is reached when a blowing murmur is heard. Thus one factor is rapidity of flow. If to such a tube one of larger or smaller caliber is joined, or if a constriction or dilatation is provided a similar murmur occurs at a rate of flow which is without sound in the tube of uniform caliber. A second factor then is alteration of the lumen. Roughening of the inner wall of the tube would act as multiple small stenosis.

It has also been determined experimentally that murmurs are more readily produced when the wall is thin, flexible and distensible and that the less viscous the fluid the more easily the sound is produced. The pressure has but little influence.

It was formerly thought that the sound arose in the fluid itself, being caused by vortices. However, liquids give rise to sound with great difficulty and only under peculiar circumstances, which, as Fick has pointed out, are never present in the animal body. The sound then is not due to vortices although these are present when sound is produced, or to the internal friction of the liquid, as murmurs are more easily produced when the internal friction is less. The sound is caused by vibration in the wall of the tube, or in the heart by vibration of the valves or heart wall.

Krehl says "Murmurs originate from peculiar movements of the blood and are the direct result of the vibration of membranes. So the vessel wall has been compared to a violin string, the moving blood to the bow.

Valvular murmurs, then, arise as the blood stream, either during systole or diastole, passes through an opening which is narrow compared to the neighboring cavities. For every grade of constriction a certain minimum rapidity of flow is necessary for the production of the murmur. So valvular lesions may be present without murmur, or the murmur may only be heard when the rate of blood flow is increased. The character or intensity of a murmur does not indicate the extent of the lesion. For a fixed rate of flow a certain degree of constriction is necessary to produce the loudest sound. The intensity then would diminish if the constriction were either greater or less than the optimum.

It will be seen that all the conditions for the production of murmurs are present in the normal heart and, as Sahli says, the astonishing

*Presented before the Southern Minnesota Medical Association, Dec. 1919, Mankato.

thing is that as a rule no murmur is present. This must be due to the fact that the rate of flow is insufficient, with a fluid as viscid as the blood, to produce sound.

The above considerations make it easy to account for those murmurs due to valvular lesions, but frequently murmurs are heard over the normal heart and these accidental murmurs have never been explained in any very satisfactory way. We may discuss briefly several of the many theories concerning their origin, as they are at least of interest. I think it quite possible that the sounds may arise from different causes, so that each theory may contain some truth.

These accidental murmurs are nearly always systolic in time, although diastolic accidental murmurs may occur in very severe anaemia. They do not differ in character from those due to organic lesions.

Sahli thinks that they are due to an increase in the velocity of blood flow in the heart and great vessels. This may be brought about either by the quicker contraction of the ventricle or to an increase in the amount of blood expelled on systole, that is, an increased diastolic filling. This theory has much in its favor. First, we have seen that under the conditions present in the heart a sufficient velocity would give rise to a murmur. Again, such murmurs if not constant, are often present in conditions where the velocity is increased, for instance in fever, anaemia and after exercise.

In rabbits, following the administration of small doses of adrenalin there is a great increase in the strength of the heart action and a slowing of the rate. Often a loud systolic murmurs develops. In fact, in these animals, anything increasing blood rapidity may pro duce a murmur. The reason for the absence of murmurs during diastole would be that the difference in caliber between the large veins and auricles and between the auricles and ventricles is much less than that between the ventricle and aorta or pulmonary artery. The blood velocity is also less.

Another explanation of these murmurs is adopted by Luethje. He found a systolic murmur very common in childhood. It was present at rest in most of the cases, in a minority it was only brought out by exercise. It was most frequent between the ages of ten and fourteen years, the period of the greatest growth in the length of the body and when the thorax is comparitively more shallow than earlier or later in life. The murmur, moreover, was more common in those individuals with flat than in those with arched chests. It was heard only over the pulmonary area or was loudest there, and was much diminished in intensity and disappeared on inspiration. That is, the murmur was apparently influenced by the space relations within the thorax, and he thinks it most easily explained by assuming a relative stenosis of the pulmonic orifice. Romberg says that in childhood the pulmonary artery is wide relative to the ostium and Luethje thinks that the difference in caliber is at the critical point, when a slight alteration due to pressure is sufficient to produce the murmur. In some cases in children the murmur can be produced by strong pressure with the stethoscope.

A third theory of the nature of accidental murmurs is that of Potain, later adopted by H. Muller. Potain says that they cannot be caused by anemia, by functional insufficiency, altered pressure or velocity, in fact that they cannot originate within the heart and consequently must arise in the lung. He believed the systolic murmur due to the aspiration of air into that portion of the lung adjacent to the heart on systole, the heart receding from the chest wall and exerting a suction action on the lung. The difference in the character of the sound compared to the normal breath sound is due to the greater filling rapidity. Muller thought the lung compressed during systole and the sound due to expulsion of air. Others claim that the lung is pushed aside without compression and that there can be no localized streaming of air in the lung.

Potain and Muller believed that the fact that these murmurs became fainter or disappeared on deep inspiration showed them to be of pulmonary origin and that such variations would not take place if they arose within the heart. In all probability some accidental murmurs are cardio-pulmonary, but few go as far as Potain and Muller in applying this theory. Sahli says that occasionally this may be the cause, while Romberg says Potain goes too far

in claiming all accidental murmurs to be of such origin.

These accidental murmurs cannot be differentiated from organic by their character so that we may say that, in the case of a systolic murmur, the diagnosis of an organic lesion must depend on other evidence of cardiac disorder. This is the point so often misunderstood.

We may now consider the effects of respiration and position on the intensity of murmurs, and some of the methods of bringing out a murmur which under certain conditions may not be audible. Muller says that all murmurs absent during rest and only heard after exertion, and those heard only on lying or standing are surely accidental, but this is certainly incorrect, and it is often a great help in diagnosis to be able to demonstrate a murmur.

The various methods adopted for this purpose have, as a rule, for their object the increase in the velocity of the blood stream, although in some cases the mechanism is difficult to understand.

It is well known that some murmurs are heard only in the recumbent, others only in the erect position. This applies to accidental murmurs and to those due to valvular disease. The respiration has also considerable influence on the intensity of these sounds. This is due partly to the varying amount of lung covering the heart, partly to the influence of respiration on the flow of blood within the heart and perhaps partly to other effects in the case of accidental murmurs, as believed by Luethje and Muller.

On inspiration the flow of blood into and from the right heart is increased. If inspiration is rapid the flow to and consequently from the left heart is slowed on account of the increased capacity of the pulmonary vessels. On slow deep respiration this effect is overcome in the latter part of inspiration and the flow increased. The conditions on expiration are exactly reversed—Valsalva's procedure slows the stream in both sides of the heart, after a momentary acceleration in the left. This alteration in the velocity of blood flow during different phases of respiration may at times be of use in locating a lesion in the right or left heart. The Valsalva experiment may be applied in the differentiation of endocardial and pericardial sounds, the former being lessened in intensity or obliterated, the latter usually increased.

As diastolic murmurs nearly always indicate organic disease, their demonstration is of particular importance. Recently several articles have appeared which have to do with the demonstration of the murmurs of aortic regurgitation and mitral stenosis in cases in which they are absent under ordinary conditions.

Regarding aortic regurgitation, it has been found that in certain cases the murmur is not heard through the stethoscope although audible when the ear is placed on the chest. Personally I have not seen such a case. Pardee shows that the recumbent position is unfavorable and that the murmur is best heard after exercise in the erect position or with the body inclined forward.

Mitral stenosis is the lesion in which the murmur is most frequently absent. Fortunately in most cases the character of the first sound attracts attention and leads us to expect the condition. Here also the murmur is best heard after exercise, but in the recumbent position, on the left side or prone. I have seen cases in which no trace of a murmur could be heard until the left lateral position was assumed, when it at once appeared.

The lesson which this somewhat desultory dissertation is intended to convey, is, in the first place, not to place too much dependence on a systolic murmur in the diagnosis of a valvular lesion, but to demand other evidence, and when a lesion is suspected, to search for the confirming murmur at different times and under various conditions. The necessity of the lesson I think has been emphasized by our late experience with candidates for the army.

DISCUSSION

DR. C. P. ROBBINS, Winona: The paper presented by Dr. Gilfillan is a very instructive and interesting one and emphasizes certain facts regarding the diagnosis of heart diseases. When we stop to consider that out of the first draft of two and a half million soldiers, 29 per cent were rejected for physical defects, and out of this percentage 13 per cent were due to cardiovacular diseases this fact itself shows us its importance.

Two factors are essential in arriving at a correct diagnosis of cardiac diseases. First, a routine

method of examination, and second, some classification of heart diseases. In the latter we divide them into functional and organic diseases.

The organic diseases we group according to some etiological factor such as those due to rheumatism, syphilis, nephritis, and arteriosclerosis.

Those due to rheumatic conditions usually begin with mitral insufficiency, and we look for some focal infection. Those due to syphilitic conditions usually affect the aortic valve or the myocardium and we have the Wassermann test. In nephritic conditions the heart may be murmurless but we have highblood pressure, and the urinary findings.

Those due to artiosclerotic conditions are part and parcel of an affection of the general system. They have local manifestations either cardiopathic, nephritic or tabetic. We know they are due to a local irritant floating in the blood current, and that irritant is due to a toxic protein.

The functional disturbances we have to deal with are the arrythmias,—extrasystole, auricular fibrillation, auricular flutter, pulsus alternans, heart block, and paroxysmal tachycardia. These cases we have to study with a polygraph, and they are due to nervous disturbances in the heart muscle.

The routine method of examining the heart which includes general inspection, pulse, sounds, shape of the heart, are essential in arriving at a correct diagnosis.

The general inspection of the body as to build, stature, gait, the color of the skin as to cyanosis, oedema, palor, flushings, dry or moist skin, the objective findings in the eye, the pupulary reflexis, the color of the lips, cheeks, the playing of the aliae of the nose, the condition of the mouth, teeth, tonsils, the scars on the neck, enlarged glands, pulsations of the blood vessels of the neck, the size, shape and conformity of the chest, the location of the apex beat all are essential.

The pulse should be studied as to rate, rhythm and quality. In mitral stenosis we have an empty pulse, a low tension and small pulse. Mitral insufficiency does not modify the pulse to a great extent. In aortic insufficiency we have the water-hammer pulse, the pulse that caves in under the finger. In aortic stenosis we have a slow, small pulse. In myocardial cases we have two types of cases, those due to degeneration of the coronary arteries in which there is bradycardia, and the other group classified under myodegeneratio cordis and toxic myocarditis wherein we have a rapid pulse or tachycardia. All myocardial pulses agree in this respect; they show arrythmia and inequality and are too fast or too slow. By using the pulse pressure divided by the diastolic pressure we find the heart load in myocarditis, which normally is about 50. In distinguishing dilatation from hypertrophy the pulse in the former is a soft pulse, with low tension, while the reverse is true of the later.

The heart sounds are as essential as the murmurs. In mitral insufficiency we have a marked accentuation of the second pulmonic sound, and in mitral stenosis there is a marked accentuation of the first apicial sound. In aortic stenosis we have the load sawing systolic murmur with the absence of the second sound, while in aortic insufficiency the diastolic murmur over the aortic area is transmitted down to the left with a little change in the sound.

The shape of the heart is of importance in diagnosticating heart diseases. In mitral stenosis the heart is enlarged to the right. The heart of mitral insufficiency enlarges mostly to the left. Both of these hearts after they have existed for a while lead to dilatation of both ventricles and so spreading of the heart laterally both right and left results. In aortic insufficiency the heart lengthens and the apex drops in the sixth or seventh interspace, so the heart is enlarged vertically. The same is true in less degree in aortic stenosis. In arterioclerosis and nephritis the heart is chiefly enlarged in the left ventricle. Hence the importance of the shape of the heart.

To recapitulate: the general inspection, the pulse, heart sounds, and the shape of the heart, together with grouping of heart diseases from an etiological standpoint, are essential in the diagnosis of diseases of the heart.

DR. CHARLES L. GREENE, St. Paul: As I listened to Dr. Gilfillan's opening remarks, it was suggested to me in case I should discuss the paper, that it is a pity we cannot forget heart murmurs. I think in the past we have devoted far too much attention to the murmur and far too little to the myocardium.

In the many years of my teaching students, have found it very fascinating, yet a difficult task, to teach them the valvular lesions of the heart without too greatly emphasizing the importance of those conditions in the complex. We devote the major part of our time to a discussion of heart murmurs. They are extremely interesting, important, and, for the most part, readily learned. They are very simple so far as their detection and their placing are concerned. The same statement, however, cannot be made of myocardial lesions. I shall have to take issue with Dr. Robbins, if I understood one of the statements he just made, that the pulse of myocardial degeneration is arrythmic. I think I so understood him. As a matter of fact, the pulse of cases of myocardial degeneration I think can be absolutely indistinguishable from a normal pulse in many instances, and I should say it was rather in the exceptional cases that we would find arrythmias. In this field especially we must reach a greater degree of perfection in the matter of early diagnosis, and that we are not yet doing, and that we cannot do until we direct our attention, not so much to murmurs or to gross changes in cardiac outline, but to the lesser signs of a diminished cardiac reserve.

We owe to Mackenzie, especially, the placing of

emphasis upon the subjective signs of heart disease, and I trust in our teaching and in our practical work each month and each year we all will find, as I have found, that the greatest possible value lies in a proper interpretation of the sensations of the patient with respect to the detection of myocardial changes and interference with myocardial reserve.

I want to say just a word or two about the so-called accidental and functional murmurs. It is quite evident from Dr. Gilfillan's statement that we are just as much in the air today ar regards these as we ever were. There is no doubt that the systolic murmurs so frequently heard in the pulmonary area may properly be called, accidental, and these murmurs can be explained very frequently on two grounds, one a diminished tonus in the heart muscle, and probably in the pulmonary artery. The other question is one of anemia. Where there is pronounced anemia you have all factors necessary to the production of a murmur especially prominent in this particular area. You have a greatly increased rapidity of blood flow, a lessened viscosity of the blood and diminished myocardial and arterial tonus. With respect, however, to the so-called "accidental" murmurs at the apex, I feel that the more emphasis we lay upon their supposed prevalence, the greater the danger we are in of overlooking true relative insufficiency due to serious myocardial disease and an actual failure of the valves to do their work.

DR. J. W. BELL, Minneapolis: Doctor Gilfillan is entitled to our gratitude for presenting in the clear and precise manner he has the interesting subject of cardiac murmur.

I agree with Doctor Greene that in the last analysis the myocardium is the part of the heart demanding the most serious consideration. In the investigation of the heart a murmur will often direct us in the right direction, consequently we should not minimize its diagnostic value. It is well to remember that the murmur is the one thing which attracts the attention of the practitioner and it will continue to do so in spite of all opposition.

DR. GILFILLAN (closing the discussion): I think the points I made in my paper were very well covered by Dr. Greene's discussion. The idea I tried to bring out was that a murmur did not make so much difference, but I think it does make a difference. For instance, a person with a murmur indicating mitral stenosis or aortic regurgitation may not be sick enough to need any treatment, yet he will probably need some direction as to his course of life, because we know that, while the heart may be competent at the time of the examination, it is a dangerous condition; it is a heart which is apt to break down, so that the patient needs the direction of the physician, although he may not need any medical treatment.

About the teaching of our medical students, it is something I have been thinking of a good deal. We devote a good deal of time in the hospital to looking up cases of mitral stenosis, mitral regurgitation, and aortic insufficiency. It would be an important thing to teach medical students that all hearts with murmurs do not need medicine; that these patients are not all sick; not all of them have valvular lesions to account for the murmurs. As Dr. Greene pointed out, a murmur over the apex may indicate myocardial trouble. That is true. Allbutt says that whenever he hears a murmur located over the apex it is indicative of mitral regurgitation, either permanent or temporary, whereas others consider it purely an accidental murmur. Of course, Mackenzie's teaching of the value of subjective symptoms in cardiac disease is very important, and I do not think any patient with cardiac disease ought to be treated who has not subjective symptoms. A patient with incompetency of the heart will manifest subjective symptoms, and unless he has these, he has not heart disease that demands treatment.

Digitalis is not good for a heart murmur. Until we get subjective symptoms indicative of insufficiency of the cardiac muscle, no medical treatment is needed.

RADIUM-X-RAY THERAPY OF CARCINOMA UTERI AND UTERINE BLEEDING*

FRANK S. BISSELL, M. D.
Minneapolis, Minn.

As aids essential to any rational attempt to combat or palliate malignant disease in its various manifestations, radium and the reontgen rays are now universally accepted. And in certain of these manifestations, an increasing number of surgeons and radiologists are advocating the substitution of these agents for surgical procedure. Such a tendency is especially marked in discussions of the treatment of cancer of the cervix. This is because the operative treatment of this disease, carefully considered from a statistical standpoint is far from satisfactory. First, the percentage of cases considered operable is low, and there appears to be a direct ratio between the percentages of reported operability and mortality. Immediate mortality is high except in the hands of the most experienced abdominal surgeons, and even Wertheim's first one hundred cases showed an operative mortality of thirty per cent.

A summing up of available statistics would seem to show that of each one hundred cases

*Read before St. Louis County Medical Society of Duluth, Minn., Feb. 12, 1920.

presenting themselves to a conservative surgeon, from twenty-five to fifty would be accepted for operation; that of this number from twenty to forty would survive the operation; that of this remaining number from eight to sixteen (von Rosthorn) would suffer post-operative sequellae, such as ureteral and bladder fistulae, often causing more suffering than the cancer itself. We would then have from twelve to twenty-four cases in which the operation could be considered successful, and of these from thirty to sixty per cent would be well after five years. And it must be borne in mind that the statistics upon which these figures are based are those of the most skilled operators. It must be admitted that a method of treatment which offers a clinical cure to but 3% (minimum) or 10% (maximum) of patients presenting themselves, and which must contend with so high an immediate mortality and so many disagreeable sequellae has but little to justify its continued employment.

Let us now consider the other horn of the dilemma, radiation therapy. Here all cases may be treated, as the indications are equally definite, whether the disease is incipient or advanced. There is no operative mortality. The local disease may be controlled and eradicated as surely as with the knife or cautery, while metastases can be attacked and, at least, held in abeyance for a variable length of time. There are two reasons why it is not profitable to consider radiation therapy from a statistical stand-point: first, its general employment is too recent for a sufficient number of cases to have accumulated; and second, the technic of application of either radium or roentgen rays is still in process of development, and results vary widely in different hands. Yet one may find in the literature reports of a considerable number of cases of advanced carcinoma of the cervix which have remained well five years after symptomatic cure under radiation therapy. And if these results can even occasionally be obtained in so-called inoperable cases, may we not reasonably expect much better statistics than have ever been shown, when all cases of cancer of the cervix are efficiently treated by means of radium and the roentgen rays?

In the more advanced, relatively hopeless cases combined radiation has certain very definite advantages over surgery. Without discomfort or shock to the patient, the debilitating foul discharge and bleeding is immediately stopped, and local healing takes place. The patient regains her strength, hope revives, and for a period varying from a few months to several years she may be symptom-free. In the mean time, metastatic foci in the pelvic lymph nodes or elsewhere are systematically attacked by massive doses of deeply penetrating and highly filtered x-rays, with the object in view of preventing proliferation and thereby arresting the progress of the disease. If this purpose fails of complete attainment and the patient eventually dies of cancer, the death is usually rapid and relatively painless, free from many of the disagreeable features of post-operative cancer deaths.

The practice of combining surgical procedure with radiation therapy has been the one most generally followed in recent years, and perhaps time alone will tell whether it affords end results as satisfactory as those of radiation alone. But if both methods are to be employed, their relation to each other must be definitely determined and the function which each is to perform must be equally well defined.

In many cases, especially of the more advanced type pre-operative treatment may be indicated if surgery has been determined upon. The local employment of radium and a full course of roentgen therapy will render the disease temporarily non-progressive and will only delay operation about three weeks. It would seem that the advantage of dealing with an arrested process is the same here as in appendicitis where every surgeon recognizes the greater risk of operating during as active phase of the disease. Likewise the possibility of establishing an open cavity into which the radium may be carried after the operation, is one which should always receive consideration. In cancer of the uterus this can best be accomplished through the vagina but it is a point often neglected by the surgeon who is prone to allow the cavity to close, before referring the case to the radiologist. Since the intensity

of the radiation varies inversely as the square of the distance, the immense advantage of an open approach to the seat of the disease process, is self-apparent. The writer cannot too strongly condemn a somewhat prevalent and very pernicious kind of cancer surgery which can only be described as meddlesome. It consists of removing by means of knife or cautery as much of the cancer mass as can be conveniently reached when it is perfectly apparent that the entire growth cannot be eradicated in this manner. The operator should feel some assurance that he can remove the whole primary growth, before he may conscientiously adopt any operative procedure. The only cases in the writers experience which have proven utterly intractable and non-responsive to either radium or roentgen rays, have been those previously stimulated to increased activity by improper surgery. To destroy part of a fungating mass in the vagina by means of the actual cautery can accomplish no purpose except perhaps to control the hemorrhage. This the radium will do as effectually, while at the same time it will inhibit rather than stimulate proliferation of the remaining cancer tissue. Reports of two cases now under observation may serve to illustrate and emphasize this point. Mrs. M. C. Aet. 62. First observed on August 11th, 1919. An extensive carcinoma of the cervix extending well up into the fundus. The cervix was deeply eroded. There had been some bleeding for two or three months, hemoglobin was 63 per cent, and there was progressive loss of weight. The surgeon to whom she reported, placed her in the hospital and immediately did a vaginal cautery operation. As he expressed it he had "cauterized everthing in sight, and if you can do anything with your radium you should be able to do it in this case." Fifty milligrams of radium properly filtered, was packed into the cavity produced by the cautery, and allowed to remain there sixty hours. There was of course no way to determine whether this accomplished any good purpose or not. Four weeks later she was given one course of intensive roentgen treatments through the abdomen and back. Already debilitated by the previous loss of blood and the cautery operation, the constitutional reaction to the x-ray therapy was severe, and she refused further x-ray treatments. Three months later, the surgeon performed a complete pan-hysterectomy, removing as much tissue as possible including one ureter. Under these conditions, it is not necessary to describe the patients present condition, after her long sojourn in the hospital ward. Nor can there be any reasonable doubt of a progressively fatal termination.

CASE No. 2

Mrs. O'K Aet. 67. About eight months ago, she noticed a slight bleeding, but this soon stopped and she did not consider it of importance. One week ago, following an enema, she had a severe hemorrhage from the uterus after which there was slight bleeding which continued up to the time of examination. Examination by Dr. Voyer showed an extensive erosion of the cervix, and a fungating mass in the vagina. When palpated through the rectum the fundus appeared large and very hard. Two days later, after confirming the above observations, the patient having been anesthetized, I placed within the cervix twenty-five milligrams of radium element filtered by three millimeters of silver and one millimeter of brass, and a similar quantity equally filtered in the cul-de-sac on either side of the cervix. This was permitted to remain undisturbed for forty hours. There has been no bleeding since the removal of the radium on October 4th, and the discharge which was very foul and profuse stopped after a few days. Improvement in general health and strength has been rapid and progressive. She has three full courses of deep x-ray treatments through the abdomen and back, given at monthly intervals. When I examined her a few days ago, I found the cervix of normal consistency, and the uterus reduced to about normal size. The mass in the vagina has entirely disappeared. By way of contrast with the other case reported, let it be noted that this patient has lived her normal life since the first two weeks, and now feels perfectly well. She may be regarded as symptomatically cured, and if she will take prophylactic treatments at intervals of six months she may remain well for several years. In any event, the prognosis should be as good or bet-

ter than that of case No. 1 while she has been spared much suffering, a long expensive stay in the hospital and the shock of a mutilating operation.

Microscopic studies of cancer tissues under radiation show that the chief effect is due to inhibition of cell proliferation. Some interesting and apparently instructive experiments with crown gall, a disease of plants which appears to resemble cancer in that its growth depends directly upon cell proliferation, are reported by Levin and Levine in The Annals of Surgery for April, 1918. The growth of the crown gall could always be stopped by x-ray radiation, while in the un-rayed controls the disease regularly developed and destroyed the plant.

Returning to the studies of human cancer, there may be no destructive action upon the cell itself, but since the latter is naturally of short life when deprived of its essential function, kariokinesis, it tends to atrophy and disappear. The cancer tissue is replaced by a round cell infiltration, which in turn is replaced by dense sclerotic connective tissue, poor in blood supply. Since this is not favorable soil for the further development of the cancer, any recurrence is likely to take place out-side of these areas.

Examination of irradiated cancer tissues, however, usually reveals occasional nests of atypical cancer cells with flattened atrophic nuclei. These cells apparently remain dormant for a variable length of time and then again, perhaps under traumatic stimulation begin to actively proliferate. It seems logical that if further treatment can be applied at the moment when these cells are beginning to regain their function, cell division can again be arrested and thus the disease may eventually be eradicated. But it does not suffice to wait for clinical evidence of recurrence when the process may be beyond control. And the deleterious effect of prolonged radiation upon normal tissues prohibits continued treatment. Hence my present technic, which seems best to fulfill all requirements, includes six months of active treatment followed by an interval of six months rest, then three to six months of treatment followed by an equal period of watchful waiting. In certain post-operative cases which have seemed especially likely to recur, a third series of treatments have been given. While the results of this most thorough procedure have been promising, sufficient time has not elapsed to justify too much optimism. In fact, the time is not yet come, when one may properly speak of "cure" of cancer of the cervix, but only better palliative results or "symptomatic cure."

Statistics rapidly accumlating are of great value and interest, but it must be borne in mind that they are based for the most part upon advanced and inoperable cases, since surgery is still the accepted method of choice in the earlier cases. Scherer and Keley, having treated 218 cases of cancer of the cervix with x-rays and radium, conclude that freedom from recurrence was 10.5% greater than operation alone formerly gave. Bumm recorded one hundred and eight cases only five of which were considered operable. Of these there had been but 15 recurrences at the time of the report. Doederlein reported symptomatic cures in 31 out of 153 cases and 12 of these had been classed as inoperable.

In the dim light of present knowledge therefor, there is much justification for the substitution of radiation for all surgery in cancer of the cervix. Yet the radiologist is not anxious to assume this responsibility alone until he has a greater mass of statistics to support him. He is however ready to demand that in all cases treated surgically, proper and intelligent radiation therapy shall be employed, and that before operation it shall be carefully determined in each case whether treatment shall be pre-operative, post-operative or both.

Certain authorities are advocating that when post peritoneal metastases are found, drainage tubes containing radium may be stitched in place in order that direct action may be had. The radium may be withdrawn and replaced at different points from time to time before the tubes are finally withdrawn. By this procedure it is hoped to effect a clinical cure in certain cases which would otherwise progress, uninterrupted, to a fatal terminus despite complete control of the primary lesion.

There is no selective action of the rays. While

it is true that the less highly differentiated cells of certain new growths or of glandular structures are more easily affected than other cells, yet this is only relative and other tissues through which the rays penetrate do not wholly escape. Since it is known that small doses will stimulate the proliferation of the same cells which larger doses will inhibit and destroy it becomes apparent that he who is too timid lest he injure normal tissues will frequently produce an effect quite the reverse of that which he is striving to attain.

The surgeon has long since learned that he cannot eradicate cancer except through the boldest sacrifice of normal tissues, yet he is often the first to condemn the radiologist who "burns" a patient in his conscientious efforts to destroy the disease. Yet, because x-ray inflammations are sometimes very painful and so chronic that they interfere with further treatment, they must be avoided as far as is possible without sacrifice of efficiency. By judicious selection of the proper filters for each case and the employment of some ingenuity in "cross firing" it is usually possible to attack the diseased tissues with the maximum quantity of radiation without seriously or permanently damaging the overlieing structures. In this connection, let us take a glance into the future, when the varying physiologic action of rays of different wave lengths will have been completely tabulated and when it will be possible to select specific rays for each condition with which radiation therapy has to contend. We are already empirically selecting different filters for tuberculosis than for cancer even though the disease is at the same depth, since experience has taught that rays of longer wave length have a more specific effect upon the former disease.

I wish to record here a single case in which the marked curative effect of roentgen radiation upon deeply seated cancer was most clearly demonstrated. To-day I should of course employ radium, as well as x-rays in this case, but at that time I was relying solely upon roentgen radiation.

CASE REPORT

Mrs. C., aged 58, was referred to me in July, 1916 by Dr. A. MacLaren of St. Paul. He had previously performed a laparotomy upon the insistance of family although he regarded the case as inoperable and had advised against operation. It was found impossible to remove all of the cancerous tissue. She was carried to my office by stretcher and I found a readily palpable mass in the vagina which bled upon slight traumatism. She was markedly anemic, in considerable pain and was rapidly losing weight.

The abdomen and back were divided off into three inch squares and a skin tolerance dose under three millimeters of aluminum was given through each of these areas. This course of treatments was repeated at intervals of one month for six months. At this time the patient was traveling alone from North Dakota to Minneapolis for treatment and there was a complete absence of both objective and subjective symptoms. In other words it was a symptomatic cure. Another series of treatments was given after three months. One year later she developed a partial intestinal obstruction from adhesions and a laparotomy became necessary. At operation no evidence of carcinoma could be found. During convalescence, however, there was a recrudescence of the disease and the patient soon died of metastatic cancer. I believe that this patient without the operative traumatism might have lived in good health a much longer time, but that she would have eventually died of cancer when the disease became reactivated.

"UTERINE MYOMA"

The treatment of uterine myoma by radiation therapy is justified by the operative mortality under surgical attack, however small that may be, and by the fact that all women have an inherent and ineradicable antipathy to the thought of such a mutilating operation, unless it is necessary for the preservation of life. Either roentgen rays or those of radium are a specific in that they completely control the only dangerous symptom, the hemorrhage. With the menopause established, the tumors tend to retrogress and a complete and permanent symptomatic cure is established. It may therefor be stated that surgical intervention is contra-indicated in these cases, except in certain selected ones wherein it is highly desirable

to preserve the menstrual function. In many cases, a diagnostic curettage is necessary to eliminate the possibility of cancer. But the argument sometimes advanced, that hysterectomy should be performed to prevent the carcinomatous degeneration of the myoma has little support in statistical studies. It has yet to be shown that carcinoma develops in myomatous uteri with greater frequency than in others in the same period of life.

The choice between roentgen rays and radium must depend upon various factors. If haste is indicated because of profuse hemorrhage, radium has the advantage, since the control is usually more prompt and complete than that of the x-rays. If the patient is an ambulatory one, and time is not so important, symptoms can be controlled with less disturbance to the patient by means of roentgen rays.

As to the action of radiation which produces the desired effect, the destruction of the Graafian follicle doubtless accomplishes the menopause. It would seem too that, with radium, there is a more immediate effect upon the uterine mucosa causing the blood vessels to contract and the congestion to recede. It is rarely necessary to apply the radium more than once but in a few instances it has been necessary to give a few roentgen treatments following the radium to completely establish the menopause.

It may conservatively be stated that it is possible by means of proper roentgen radiation, or radium applications or of both judiciously combined, to establish an artificial menopause in any case at any age. It is probably not possible, at least with any known technic, to effect a cure of myoma or fibroid tumor without producing a menopause. On the other hand certain cases of metrorrhagia of unknown etiology respond so readily to light dosage that normal menstruation is not interfered with while the ad interim bleeding is entirely stopped. Those cases which are characterized by general fibrosis of the uterus without demonstrable tumor seem to respond to roentgen radiation less readily than the myomata, but they are promptly controlled by radium.

I have had occasion to treat twenty-three cases of menorrhagia due to fibroid tumor or myoma in the past three years. With but one exception results have been wholly satisfactory. The exception was one of my early cases, treated before my technic was well standardized, and in this instance there developed a deep x-ray inflammation of the abdominal wall which required surgical removal. While I do not believe such an accident is possible with my present technic, it is an accident which many roentgen therapists have had in their earlier experience, and should serve as a warning to beginners.

The cessation of the menses is usually gradual under x-ray treatment, so that it has required from four to six months, in the writer's experience, to completely establish the menopause. As previously stated, radium will do the work more promptly. Two cases of uterine tumor with pressure symptoms but no abnormal bleeding have not responded in a satisfactory manner. The menopause was accomplished, and the tumors became smaller, but the symptoms, mostly neurotic in character, continued.

The following case reports are presented to illustrate the various types of cases which have responded well to treatment.

METROPATHY OF QUESTIONABLE ETIOLOGY

Mrs. E. H. McV. age 22 years, was referred by Dr. J. C. Litzenberg for x-ray treatment. She began menstruating at the age of thirteen but had never menstruated normally. For the past six years, there has been continuous bleeding eight months of the twelve. At this time, Sept. 21st, 1918, there has been a constant flow since May, and it is now quite profuse. Hemoglobin is 55 per cent. Treatment consisted of a 2/3 skin-tolerance dose given through two ports of entry with a filter of four millimeters of aluminum. The following day the bleeding stopped and did not recur for four weeks when she menstruated normally for three days. Since that time, with the exception of a brief pregnancy followed by miscarriage, menses have occurred at twenty eight-day intervals, and lasted for three to four days.

FIBRO-MYOMA

Miss M. H., Aet. 42, a school teacher, was referred by Dr. Olga Hanson on Nov. 9th, 1918.

The tumor could be palpated through the abdominal wall and reached nearly to the umbilicus. For several months, there had been a menorrhagia lasting about ten days, with each period. Through twelve ports of entry, abdomen and back she was given a skin tolerance dose, four millimeters of aluminum being used to filter the rays. On Nov. 30th, there was a noticeable reduction in the size of the tumor, and she reported a marked decrease in the flow. Treatment was repeated at twenty one day intervals up to and including Jan. 18th, 1919. At this time the menses had entirely ceased, and the tumor was no longer palpable through the abdomen. She was discharged as cured. There has been no recurrence of menstruation, her general health is much improved, and she has gained about twenty five pounds.

UTERINE FIBROSIS

Mrs. J. H. K., referred by Drs. Cross and Litzenberg. The uterus was somewhat enlarged but no tumors could be demonstrated. Diagnostic curettage had proven negative. Menorrhagia was profuse and uncontrolable. She was given two courses of x-ray treatment, one on Nov. 11th, and one on Dec. 3rd and 5th. After the first there seemed to be marked improvement, but later the bleeding recurred and it was decided to resort to radium as the patient was becoming exsanguinated. On Dec. 20th, she was given 2000 MgHr. the radium being placed in the cervix and cul-de-sac. There has been no further loss of blood and the patient is rapidly recovering her normal blood picture.

Mrs. C. S., a physician's wife, referred by Dr. Ritchie, of St. Paul, has had five pregnancies and the last two have been concluded by difficult instrumental deliveries. At each menstrual period she has an excessive flow for five or six days followed by a slight but continuous flow for two weeks. A curettage in Feb. 1919 has proven negative from both a diagnostic and therapeutic stand-point. No pathological process could be found, but hysterectomy was under consideration. She has been given three courses of roentgen treatments, and at this writing the menstrual flow has assumed normal proportions.

CONCLUSIONS

Combined radium and x-ray therapy is the treatment of choice in all cases of cancer of the cervix.

In the early cases, conservative surgery followed by radiation is justifiable but probably the latter alone will prove equally efficient.

In carcinoma of the fundus, surgical results have been so good, that these cases should all be submitted to operation. As in all other cancer cases, however, the patient should be given the added benefit of post-operative radiation.

Radiation should be accepted as a specific in the menorrhagias due to myoma or fibrosis or those of unknown etiology.

TUBERCULOSIS OF THE THYROID*

By W. A. PLUMMER, M. D.

A. C. BRODERS, M. D.
Sections on Medicine and on Pathology, Mayo Clinic
Rochester, Minn.

The literature on tuberculosis of the thyroid may be divided into three classes: (1) Reports of isolated cases usually of the so-called primary type, in a number of which the clinical picture and pathologic appearance of the gland had been modified by secondary infection and abscess formation; (2) descriptions of the histologic findings in thyroids obtained in routine necropsies in persons having died of general miliary tuberculosis; and (3) studies based on reviews of the pathology of simple and exophthalmic goiters.

Reports such as those of Fraenkel in which tuberculosis of the thyroid was said to have been demonstrated in all except six of 580 necropsies following deaths from general miliary tuberculosis are of value, but clinicians are especially interested in reports based on pathologic material from persons who have had definite goiters or who have complained of symptoms due directly or indirectly to thyroid disease.

Ruppanner, in 1908, reported 3 cases of colloid goiter in which he had demonstrated areas of tuberculosis. Werdt, in 1911, found tuberculosis in one gland in 28 cases of ex-

*Presented before the Minnesota State Medical Association, Minneapolis, October, 1919.

ophthalmic goiter, and in three glands in 444 cases of simple goiter. Mosiman, in 1917, reviewed the literature and reported 9 cases in which operation had been performed in the Crile clinic. The glands in 5 cases which had been previously diagnosed exophthalmic goiter also showed hyperplasia. One of 2 patients who had been designated as having had mild or questionable exophthalmic goiter had hyperplastic areas; one patient who had had hypertension, and another, were sarcoma of the thyroid did not show hyperplasia.

Mosiman's admirable report brought out the striking relationship between hyperthyroidism and tuberculosis of the thyroid. This association is evidently not a coincidence; either a hypertrophic gland is rendered more susceptible to invasion by the tuberculosis bacillus or the infection stimulates the parenchyma to an abnormal activity and is thus indirectly responsible for the hyperthyroidism with its attendant symptoms. Although the great majority of hypertrophic thyroids are not tuberculous, any infection which may even in a few instances be an etiologic factor is of interest in dealing with a disease the cause of which is so shrouded in mystery.

Few, if any, of the cases of tuberculosis of the thyroid which have been reported were diagnosed previous to the microscopic examination of the glands. The condition was not suspected in any of our cases previous to operation, and their study was pursued in the hope that some evidence might be gained which would indicate whether or not the hypertrophy was secondary to the tuberculous infection, and also with a view to determining, if possible, any diagnostic points which in the future might lead us at least to suspect the condition previous to or at the time of operation. In using the term hypertrophy we refer to the cell hypertrophy, that is, the transition of the normal cuboidal to the columnar type of epithelial cell.

We shall report briefly 7 cases that have been under observation in the Mayo Clinic. A full discussion of the symptoms and findings will not come within the limits of this paper. For convenience these cases are divided into three groups: (1) Cases with high degree of hyperthyroidism, (2) cases with a moderate degree of hyperthyroidism, and (3) cases in which hyperthyroidism was mild or absent.

Case 1 (Group 1). This patient had had general symptoms for four years but no local symptoms. The thyroid gland was diffusely enlarged and slightly nodular, but not unusually hard. There was no tenderness to pressure. Bruits and thrills were present. The basal metabolic rate was +48. A clinical diagnosis was made of exophthalmic goiter, with the degree of severity 3 on a scale of 1 to 4. At operation the gland was thought to be hypertrophic with multiple adenomas. The pathologic examination revealed scattered areas of tuberculosis, a slight amount of fibrosis, some round cell infiltration, and extensive parenchymatous hypertrophy.

Case 2 (Group 1). This patient had been conscious of the goiter for eight months; symptoms had been noted for ten months. The basal metabolic rate was +87. The thyroid gland was slightly enlarged with the granular "feel" of a hypertrophic condition. Bruits and thrills were present. The clinical diagnosis was exophthalmic goiter, degree of severity 3. At operation both lobes were found to be about two and one-half times normal in size and had the appearance of an ordinary hypertrophic gland. The pathologic findings were the same as those in Case 1.

Case 1 (Group 2.) The goiter had been diagnosed by the family physician six months before. General symptoms had been noted for two years; there were no local symptoms. The thyroid gland was about normal in size; it had no nodules but was unusually hard for a hypertrophic gland. The basal metabolic rate was +26. Exophthalmic goiter was diagnosed, the degree of severity 2. A normal sized gland which appeared to be hypertrophic was found at operation. Extensive tuberculosis, a moderate amount of fibrosis and round cell infiltration, and a fair degree of parenchymatous hypertrophy were found on pathologic examination.

Case 1 (Group 3). The general symptoms in this case had been present for one year; no thyroid enlargement and no local symptoms had been noted. The patient's neck was short and fleshy, and, except for a hard nodule on the left side about 1.2 or 1.8 cm. in diameter,

neither lobe of the thyroid could be palpated. The isthmus was palpable and unusually hard. The basal metabolic rate was +21. The diagnosis was definite hyperthyroidism, with degree of severity 1. The condition was considered unusual and thought to be exophthalmic goiter or thyrotoxic adenoma. The gland was found firmly adherent to all the surrounding structures, muscles, fascia, and trachea. Very little bleeding occurred during the removal of the gland which indicated an old inflammatory condition. In cutting across the gland the surgeon found a large amount of scar tissue. The pathologist reported extensive tuberculosis, marked fibrosis, round cell infiltration, slight parenchymatous hypertrophy, and great destruction of the gland.

In the goiter of Case 2 (Group 3.) Four months before this patient's examination enlargement of the right lobe had been noticed. General symptoms had probably existed for one year; there were no local symptoms. The thyroid had the contour of a normal gland, although about three times its normal size; it was hard, and slightly nodular. The basal metabolic rate was +21. A tentative diagnosis was made of mild hyperthyroidism, with degree of severity 1, probably exophthalmic goiter, possibly carcinoma of the thyroid. At operation the gland was found to be hard and resembled carcinoma but was believed to be some form of infection throughout the gland. As in Case 1 of Group 3, the pathologic examination revealed extensive tuberculosis, marked fibrosis, round cell infiltration, slight parenchymatous hypertrophy, and extensive destruction of the gland.

Case 3 (Group 3.) The general symptoms had probably been present for two years. The patient complained of pressure in the throat. A very hard tumor in the left lobe of the thyroid was not sensitive to pressure; no bruits were heard in the thyroid vessels. The metabolic rate was not determined. A diagnosis was made of neurasthenia with a possible thyrotoxicosis from an adenoma. Because of the density of the tumor, carcinoma of the thyroid was also considered. Examination of the gland removed at operation showed degeneration and inflammation. The only normal tissue remaining was that in the pyramidal lobe. The surgeons were suspicious of malignancy. The pathologist discovered about the same amount of tuberculous destruction as in Cases 1 and 2 of this group, but more parenchymatous hypertrophy.

Case 4 (Group 3.) In this case enlargement of the right lobe of the thyroid had been noticed for one month. Three weeks before examination the left side had begun to enlarge. A neurasthenic syndrome had been present for years. The lobes were not greatly enlarged, but were very hard; a small nodule could be palpated in each. A clinical diagnosis was made of a small adenoma of the thyroid, possibly carcinoma, because of the recent development and extreme hardness of the gland. At operation a small hard tumor pressing on the trachea was found. The surgeons were unable to exclude malignancy, but considered the condition inflammatory. The pathologic findings were practically the same as in the other cases in Group 3, although there was more destruction and fibrosis, and no parenchymatous hypertrophy.

The 2 cases in Group 1 represent typical high grade exophthalmic goiters. Before operation the glands were believed to be ordinary hypertrophic thyroids. The surgeon did not detect any unusual condition. The pathologist reported extensive parenchymatous hypertrophy with tuberculosis in scattered areas.

The single case in Group 2 represents an intermediate stage. This was a case of typical exophthalmic goiter, but with a less severe degree of hyperthyroidism. The surgeon apparently did not consider it more than an ordinary hypertrophic gland. The pathologist reported a fair degree of parenchymatous hypertrophy, also very extensive tuberculous involvement.

In all but one of the cases in Group 3 the thyroids were smaller than those in Group 1. The glands were hard, somewhat fixed, and nodular; two of them had grown rapidly. The clinician had recognized an unusual condition in all, and had suspected carcinoma in three. In the first 2 cases the definite evidence of a mild degree of hyperthyroidism was confirmed by basal metabolic rates. The last 2 patients were examined before we had the means of estimating the basal metabolism;

however, hyperthyroidism had been suspected in the first of these; in the last case no mention was made of the possibility of hyperthyroidism. The parenchyma of this gland was so completely destroyed that the diagnosis of the absence of hyperthyroidism made at that time was probably correct. The striking point in the cases is that 5 of the patients probably 6, were suffering from hyperthyroidism. The greater the tuberculous involvement the less severe the toxic symptoms. This may be explained by the more extensive destruction of the glands.

In 2 of the 5 patients with definite hyperthyroidism the goiter was noticed before the symptoms; in 2 the opposite was true, and in one no thyroid enlargement had been discovered. In these findings there is nothing decisive to indicate that tuberculosis preceded the hyperthyroidism. Even had we had a larger series it is doubtful whether definite conclusions could have been reached, as such tuberculous processes would undoubtedly have been progressing for months before the enlargements could have been noticed. The symptoms in these cases are so insidious that the time of the onset of the condition is difficult to determine. Probably all cases of tuberculosis of the thyroid are secondary to some process elsewhere in the body. In this series if such foci were present, they were too small to have any clinical significance; evidence of active tuberculosis elsewhere in the body could not be demonstrated on critical examination.

In Case 2 of Group 3 definite evidence of myxedema appeared at the end of two months. This condition has also been noticed in cases of simple chronic thyroiditis following operations. It is questionable whether the usual amount of thyroid tissue should be extirpated when the gland is inflammatory, because of the possibility of a resulting hypothyroidism caused by the subsequent destruction of the remaining parenchyma. Cases of the type placed in Group 1 can not be distinguished from ordinary exophthalmic goiter.

In cases similar to those placed in Group 3, the condition may at least be suspected before operation. Carcinoma of the thyroid may be associated with hyperthyrodism, but the growth is usually more nodular, and is not so apt to involve the entire gland without causing a much larger tumor. Chronic simple thyroiditis may give the same thyroid signs as tuberculosis, but in our experience it has not been associated with hyperthyroidism. Sarcoma of the thyroid is a rare condition, and we have never had a case of actinomycosis.

Three of our patients were operated on too recently to give us any definite information as to the ultimate prognosis following operation, but they have all been benefited. One patient had myxedema. One is in perfect health two years following operation. The other two have not been heard from recently.

REFERENCES

1. Fraenkel, E.: Ueber Schildrüsentuberculose. Arch. f. path. Anat., civ, 58-72, April, 1886.
2. Mosiman, R. E.: Tuberculosis of the thyroid, Surg., Gynec. and Obst., xxiv, 680-693, June, 1917.
3. Ruppanner, E.: Ueber tuberkulose Strumen, ein Beitrag zur Kenntnis der Schildrüsentuberkulose. Frankf. Ztschr. f. Path., ii, 513-547, 1908-1909.
4. v. Werdt, F.: Ueber Lymphfollikelbildung in Strumen. Frankf. Ztschr, f. Path., vii, 401,444, 1911.

DISCUSSION

DR. W. W. HERRICK, Columbia University, New York: Mr. Chairman, Gentlemen: There is one feature of this paper which is of rather general interest. The function of focal infection in stimulating abnormality of this gland has been repeatedly brought up. We have in this paper an example of a single infection inciting abnormal activity of this gland. Perhaps the tubercle bacillus is the only one that can be demonstrated at operation, and it is an interesting clue which might be followed up in looking for other organisms in connection with abnormal thyroids.

DR. E. L. TOOHY, Duluth: I would like to ask if it is not possible for an ordinary focal infection to stimulate a normal thyroid without any evidence of tumor formation or thyroiditis, and yet after removal of the focal infection to have the patient revert to normal.

DR. GEORGE DOUGLAS HEAD, Minneapolis: Mr. Chairman, Gentlemen: I want to ask one question. During my past twenty-two or twenty-three years experience I have run across a few cases of acute infective thyroiditis. The subsequent history and the course of these individuals we have never been able to follow up and I have lost track of them. In the material at Rochester,—this is an allied subject to this one and I think is a bit out of order,—but in the large series observed at Rochester I should like to know whether they find any considerable number of cases of hyperthyroidism which give a history

of acute thyroiditis in early life, and if so what the percentage is? It is allied to this matter of infection of the thyroid, the tubercle bacillus being only one of the various bacteria.

DR. W. A. PLUMMER: Because of the rarity of the disease under consideration a criticism might be offered on the presentation of a paper on this subject before the society were it not for the close relationship in pathology and symptomatology to ordinary exophthalmic goiter. Excluding these cases it has been our experience that patients suffering from hyperthyroidism have not given a history suggesting a previous thyroiditis. In a few cases in which the glands showed marked chronic inflammation, but which were not tuberculous, there was no symptomatology suggestive of hyperthyroidism.

In many hypertrophic glands of typical exophthalmic goiter there is some round-cell infiltration, but beside this finding we have had very little evidence to lead us to believe that direct infection of the gland was responsible. The tonsils have been considered as a possible focus. However, in exophthalmic goiter there is a hyperplasia of all the lymphatic structures and it is possible that the enlargement of the tonsils and the increased tendency to tonsillitis is a result rather than a cause.

THE UTERUS AT THE MENOPAUSE*

BY ERNEST Z. WANOUS, M. D.
Minneapolis, Minn.

In reviewing the literature of pelvic pathology, one is impressed with the great variety of therapeutic measures that have been suggested and the many operative methods that have been devised in the treatment of these conditions. There is but one conclusion that can be deduced from such an analysis—there is a great need for the standardization of the technic. It is too extensive a field to discuss in the time allotted, and for that reason it seems best to speak of that particular phase of the subject fraught with the greatest danger.

The period at the menopause, with its complex symptomatology and insidious pathology, is often treated by temporizing measures until the period of life-conserving opportunity has passed. The unusual hemorrhage, the peculiar discharge, the pelvic pressure have carelessly been called, "the change symptoms," and with the assurance that all will be well soon, the patient is dismissed. The adoption of radical measures in dealing with such conditions, at this period, offers the surest protection to women from cancer.

The atypical uterine hemorrhage, or the returning flow about the period of the menopause, is the most pronounced danger signal, warning us of conditions which require timely correction to eliminate what, today, should be recognized as truly a precancerous state. In general, it might be stated that any pathology of the cervix, or fundus, may be regarded as a precancerous condition which may not present any special symptomatology until gross malignancy manifests itself. It seems timely to review some of the more frequent disturbances presenting themselves in our routine work, such as require painstaking diagnosis to insure proper treatment.

FREQUENT PATHOLOGICAL DISTURBANCES

The first class includes the cases generally recognized as chronic metritis, hemorrhagic endometritis, cervicitis, and pelvic inflammation. Practically all have a uniformly enlarged hard uterus, though occasionally the uterus is flabby, and all belong to that class so frequently curetted only to have a recurrence of the symptoms. These are the cases that are being extensively treated by the application of radium and many favorable statistics are being compiled in its favor. We must bear in mind, however, there is always danger of spreading an infection, if present, with the radium treatments, and in many of these cases the end-results will be much more satisfactory by resorting to the more radical surgical measure.

The second group might properly be classified as the fibroids. In this class we must remember that the presence of the tumor, especially the large growths, or the multiple fibroid, gives rise to essential pathological changes in the adnexa through circulatory disturbances. Various cystic diseases of the ovaries, chronic salpingitis, or hydrosalpinx are frequent complications of fibroids, being in a great measure the cause of pain, from which the woman seeks relief. While it is not difficult to palpate a uterine tumor of moderate size, the large, or the multiple tumors, with possible adhesions, or necrotic changes are difficult to diagnosticate previous to the opening

*Read before the Southern Minnesota Medical Association at Rochester, June 23-24, 1919.

of the abdomen. With the fibroid growths, the coexisting development of carcinoma of the uterus, or in the growth itself, must not be overlooked. The treatment of the second group, in the writer's opinion, is surgical because of the frequent complicating pathological conditions in the adnexa and the unrecognizable degenerative changes, many times impossible to determine previous to operation. The use of radium will control the hemorrhage and reduce the size of the tumor in the uncomplicated cases, but its use is limited and should not be applied indiscriminately in the complicated cases. The relief of the symptoms is necessary, but the restoration of permanent health of the patient is the ideal of surgery. The indications for operation are, a rapidly growing tumor, pain, pelvic incarceration, adnexal and ovarian disease.

The third class is the carcinoma,—the class that gives us the greatest concern, because of the great difficulty confronting us in arriving at a positive diagnosis, when the case is in its incipiency. The greatest hope of eradication of the disease is at a period when definite symptomatology is not yet well established. After a woman has stopped menstruating for some months and she begins bleeding again, one must always suspect malignancy. If the involved area is in the region of the cervix, an excision of a portion of the cervix may be resorted to, or a curette may be used if we suspect an involvement of the fundus, to obtain material for a microscopic examination. Either of these procedures may give us a negative diagnosis, as cancer cells may not be included in the specimen. However, this method will confirm many clinical diagnoses, and may help in a decision for an early operation. Every hospital at the present time should be equipped with a laboratory where a frozen section could be made and an immediate radical operation should be performed, in case the diagnosis is positive, in this way obviating the danger of spreading the disease. The use of radium, in this class, is positively contraindicated at the early period. Its use in the pelvis, as elsewhere, is efficacious in post-operative treatment; also, in cases where the disease has become so extensive that excision is not possible. A woman can be made more comfortable and the discharge reduced by its use, much to the happiness of the patient.

The frequency of carcinoma of the uterus is best expressed by quoting Bland[1] who states that about eighty-seven per cent of all cases of uterine cancer occur between the ages of thirty-five and sixty-five. Thirty per cent of all cases of cancer occurring in women originate in the uterus. One woman out of every twenty-seven, or about four per cent, die of uterine cancer. As diagnostic criteria, the local symptoms are the most dependable, and in order of frequency and importance are hemorrhage, leucorrhoea, pain, bladder, and rectal irritability.

From the study of Rubin[2] we learn that the cervix suffers the brunt of obstetric trauma, as well as infections, hence the great frequency of cervical carcinoma, as compared to carcinoma of the corpus; that carcinoma of the body is most often associated with polypi or myomata; that the malignant change occurs after a long period of irritation and is rendered more likely, when the retrogressive changes set in, and when the protective influence of the endocrine glands, especially that of the ovaries, begins to abate.

It would be well to premise that every pathological uterine condition, about the period of the menopause, is of a malignant nature until, by careful analysis, it can be disproven.

THE TREATMENT OF PATHOLOGICAL CONDITIONS

After the period of reproduction has passed, total abdominal hysterectomy should be done oftener than it is. It should always be the operation of choice in suspected malignant conditions. In many cases, with a history of long standing symptoms, if cancer is not already present, it may develop later. The fear of a scar or sentiment, should never deter one from fearlessly attacking these pathologeal conditions. Repeated conservative operations are not only annoying to the surgeon, but they often deplete the physical condition of the patients, upset them mentally, and reduce them to a state of semi-invalidism from which they never recover.

It is time to conclude that the vaginal route is a splendid avenue for pelvic drainage, but not a natural gate-way for pelvic surgery. No matter how dexterously one can remove the

uterus through the vagina, he is not doing his patient justice in practicing this method. The best results can be attained only by exposing all parts to the eye as well as to the touch. In removal of the uterus, for malignant conditions, the widest possible extirpation of tissue should be practiced. The adjacent parts must be left properly supported by the attachment of the ligaments, and the cut surfaces in the pelvis thoroughly covered by peritoneal membrane. This can be done only through the suprapubic incision.

Pioneers of pelvic surgery surely did not leave very encouraging statistics for abdominal hysterectomy. We must remember, however, that their shocking mortality was due largely to sepsis, and not so much to faulty technic. The basic principles of Freund's technic, for abdominal hysterectomy, are the steps followed, practically, by the operators of today. The development of aseptic surgery has obviously reduced the mortality, and statistics show it to be a safe method. The necessity for the abdominal route has always been self-evident.

CONCLUSIONS

1. It is necessary to exercise the highest degree of diagnostic skill in differentiating pathological conditions, that malignancy be not overlooked, at the period of the menopause.
2. Many symptoms that have manifested themselves over a long period are precancerous and should be treated as early cancer.
3. When the retrogressive changes set in and nature is about to obliterate the organs of reproduction, total abdominal hysterectomy should be practiced, if pathological changes necessitate the removal of the uterus.

REFERENCES

1. Bland. Am. J. Obstetrics , N. Y., 1918, LXXVIII, 554.
2. Rubin. Am. J. Obstetrics, N. Y., 1918, LXXVIII, 353.

DISCUSSION

DR. LEDA STACY, Rochester: Dr. Wanous has very forcefully called attention to the frequency of carcinomatous degeneration of the uterus at the time of the menopause. This fact should be kept constantly in mind when taking a history and making an examination at this period of life.

The statistics of the Mayo Clinic during a period of ten years show that only 44 per cent of the cases of carcinoma of the uterus were operable at the time of examination; Dr. Howard Kelly reports a percentage of 50; and Dr. Wertheim 65 per cent operability in the cases of cancer of the uterus at the time of examination. This means that the medical profession has neglected the education of the laity regarding the symptoms of malignant degeneration of the uterus.

I would add to the symptoms which Dr. Wanous has mentioned, that of an abnormal leukorrhea, or a watery discharge with an odor, as one of the early symptoms of carcinoma of the uterus.

The treatment of all operable cases is still surgical, followed by the use of radium and x-ray. As the essayist has said, the ultimate results of radium therapy are not as yet sufficiently known to resort to the use of radium in the early cases. I agree with the essayist as to the necessity of a correct microscopic diagnosis at the time of curettement and if the tissue is reported malignant, the radical operation should be done immediately.

The fallacy of basing a diagnosis entirely upon the findings at the time of curettement has been pointed out. The curette may not come in contact with the carcinomatous area, and a negative report made and valuable time lost to the patient.

As a result of atrophic changes in the endometrium, stenosis of the uterine canal may occur and a chronic endometritis may develop into a pyometritis. In an occasional case, drainage is not sufficient and surgical interference may be indicated.

In reviewing the postmortem examinations at Johns Hopkins Hospital in 742 autopsies performed on women over 20 years of age, it was found that 10 per cent of all white women and 33 per cent of all colored women had one or more myomas of the uterus. The tumor had undergone some necrotic degeneration in 17 per cent of these cases. Hence the possibility of degeneration of myomas at the time of menopause must be borne in mind, as the atrophic changes in the blood supply may produce degenerative changes in the myoma.

As brought out by Dr. Wanous, radium should be used only in those cases of uterine myoma in which there is no evidence of pelvic inflammation, as it may light up an old dormant infection.

PROLAPSE OF THE UTERUS*

By W. A. Coventry, M. D., F. A. C. S.
The Duluth Clinic
Duluth, Minn.

This paper is based on a report of fifty consecutive cases of prolapse of the uterus coming under our observation and operated during the past six years. From our observations and experience gained in these cases, as well as from watching and seeing the results of other types of operation for prolapse, I believe that our results give by far the greater percentage of cures, not only anatomically but also symptomatically.

Our cases show as to ages, 6 cases coming in the sixties, 17 in the fifties, 18 in the forties, 7 in the thirties, and two in the twenties. As can be seen, the most frequent age seems to be in the forties and fifties.

All of our patients had had children previously with one exception. Two cases had been previously operated by other methods with recurrence, and one case had been operated twice before for the same condition with recurrence. As a rule, the patient will come in with her own diagnosis, ie. "the womb comes down." However, in many cases, instead of one symptom as above, which on examination may reveal only a cystocele and rectocele, quite a number of cases came in with the primary complaint of uterine bleeding, not profuse, but continuous. On examination one finds a third degree prolapse, with marked ulceration of the cervix. With some the chief symptom seemed to be inability to properly empty the bladder, with some incontinence, others had residual urine.

Although it is very difficult to classify cases as to degree of prolapse, still we have attempted to do so:

In the first degree, we put those in whom we find more or less laxness of the perineum, with possible retroversion, and possibly a small cystocele, and no marked prolapse of the uterus, but a marked degree of laxness of the pelvic floor. In the second degree there is a retroversion, cystocele usually, and occasionally a rectocele. On grasping the cervix with tenaculum forceps you may pull it down through the vulva, or by asking the patient to strain and bear down one can force the uterus through the vulva. In the third degree the patient is able to completely expel the uterus.

In all our cases cystocele has been found, the anterior fascia having been torn and allowing the bladder to descend. In many of the cases this was the first symptom or the first sign that the patient had of a possible prolapse. Rectocele has been fairly common, but not so frequent as cystocele. Laceration of the cervix may or may not be found. However, all our cases that had a third degree prolapse had an erosion of the cervix. We have never seen a malignant growth of the cervix in these cases. The uterus is always retroverted or in middle position. In many cases the cervix had become elongated, particularly where the prolapse has been of long standing.

In those cases coming under first degree, or, as one might say, in those cases headed towards a prolapse, we prefer the Baldy-Webster operation, and repair of the perineum and cystocele has been sufficient to give the patient a great deal of comfort and to cure these cases.

In the second and third degree prolapsed cases, one must here use some judgment before deciding on the exact type of operation that one wishes to do. As said before, cystocele invariably is present. In these advanced cases in our opinion there is only one type of operation that combines safety, comfort to the patient, and the largest percentage of cures. I refer here to the interposition operation, whether after the so-called "Wertheim-Watkins" method or the so-called "Mayo" method. If the uterus is of good size and not atrophic, I prefer the former; if atrophic, by all means the Mayo method.

It may not here be amiss to go briefly into detail as one proceeds with the operation: After thorough application of Iodin the cervix is grasped with tenaculum forceps, and an inverted "T" incision made in the anterior vaginal wall. Then by gauze and blunt dissection the bladder is readily freed, both laterally and anteriorly. There is practically no danger of injuring the ureters, because before you come to them you will undoubtedly get into a plexus of veins, which, however, one should guard against rupturing if possible. The blad-

*Read before the Minnesota State Medical Meeting, Oct. 1-3, 1919, Minneapolis, Minn.

der is now freed from the anterior uterine wall and the anterior cul-de-sac entered, taking great care, however, not to tear into the bladder. Many times one can determine at this point whether he should do the Wertheim-Watkins or the Mayo type operation. If the Wertheim-Watkins operation, the fundus of the uterus is grasped and pulled down and out, so as to expose it at the vulva. At this stage, if one should have adhesions posterior, they can be freed, or if fibroids should be encountered they may be taken care of as one thinks best. After the uterus has been pulled forward and the bladder has been shoved up, the anterior peritoneal flap is now stitched to the posterior uterine wall. At this stage the uterus is practically extraperitoneal. The redundent anterior vaginal wall is now excised, and by interrupted stitches, which include the anterior uterine wall, the anterior vaginal wall is closed. The vaginal wound is then closed.

In closing the anterior vaginal wound, two important stitches must be inserted: (1) The most anterior stitch must be so placed as to pass through the vaginal wall, picking up the deep fascia lying laterally to the urethra, and then passing through the fundus rather high up, coming out in the reverse order on the other side. This tucks the bladder well up and places the fundus and the uterus snugly under the pubes. (2) The other stitch of importance is the one in the anterior cervix, placed so as to make a firm union of perimetrium, uniting in front of the cervix, and in this way the cervix is pushed well posterior.

The short arm of the vaginal incision is now stitched laterally, so as to elongate the enterior vaginal wall. The cervix may be repaired or amputated as one sees fit, but here it must be borne in mind that the bladder is often dragged far down on the anterior wall of the cervix, especially when elongated. If one proceeds to do the Mayo method the short arm of the inverted T incision is carried around the cervix and a vaginal hysterectomy is done, the broad ligaments and the perimetrium being united in the center, and this brought down as a shelving portion, taking the same place that the uterus takes in the Wertheim-Watkins operation. This elevates the bladder and gets rid of your cystocele, at the same time preventing any hernia of the pelvis. The next, and very essential step is the repair of the perineum. Personally, my best results and most comfortable ones have been obtained by a method shown to me by Beckman at Rochester, the essential feature of which is the bringing together or uniting of the lateral bellies of the levator ani muscle, so as to insure a good firm union. Then with a continuous catgut stitch the fascia is united, and the skin closed by the subcuticular method. The perineum should be made as high as it possibly can be, this of course depending a great deal upon the age of the patient as well as her social status. If the patient has not passed the menopause, the question of sterility must be very frankly discussed with both the patient and her husband. The method of sterilizing followed has been to cut out the horns of the uterus and also excise a section of the tube.

Postoperative recovery in these cases has been very satisfactory. Many of them have had to be catheterized, but this should be guarded against if possible. The danger of urine trickling over perineal stitches is greatly overestimated. Unions have been in practically all cases by primary intention. Occasionally there is a little sloughing from tension of sutures, but the end results have all been very satisfactory. The patients have been extremely comfortable.

If catheterization is necessary it must be done with an extreme amount of care on account of the easy development of a cystitis. If cystitis develops it sometimes is rather troublesome affecting a cure because of the formation of pockets in the bladder, caused by the lifting up of the uterus.

We have encountered several postoperative complications, which in a review of the literature I see have also happened to other operators:

First, the question of cystitis. Many of these cases have had residual urine with a colon infection before operation. Others developed a cystitis with catheterization after operation. A cystitis in these cases is usually accompanied by a marked trigonitis, which is extremely difficult to cure. One of our cases has now been under observation for about two years and still occasionally has to come in for bladder irriga-

tions, there being a marked redness of the trigone.

The second complication is bladder pockets. This occasionally accompanies as an end result, due to the fact that the uterus presses upward, the bladder not having been freed as extensively as it ought to have been. This leaves a very unfortunate complication which it is extremely hard to treat properly, i. e. to get permanent results. One case under observation for two years can be made comfortable only by irrigation of the bladder with the injection of argyrol.

Incontinence of the urine we have not experienced. The return of the prolapse we have not experienced. In one case the perineum probably is not as good as it ought to be and allows a slight descent of the cervix. However, the cystocele and rectocele are cured, and there is no tendency for the uterus to come out. This case could not be classed as a failure, but was not an entirely satisfactory result. Pregnancy has occurred in one case postoperative in which the patient was supposedly sterilized at time of operation. After operation the horns of the uterus were excised but no portion of tube removed, and two years later the patient become pregnant. It was necessary at the seventh month to do a Cesarean section, which was done without any particular operative difficulty. The baby lived only three hours, however. The Cesarean section was elective. For the last three years this patient has not become pregnant, and probably is now safe. Dispareunia has been the complication and end result in two cases, of course due to too high repair of the perineum. In one case it was necessary to do a slight plastic under a local anesthetic in order to relieve the condition.

However, in view of the number of cases reported, the percentage of end results has been exceptionally satisfactory. The operation, as all vaginal operations are, is much more devoid of danger than abdominal operations, and therefore our conclusions are that we can unhesitatingly recommend this operation, not only for its comfort to the patient but also for its decrease of operative risk, and as most of these cases occur in patients in the forties and fifties it gives the patients a great deal of comfort to know that something can be done for them, whereby, without great operative risk, they can be made comfortable the rest of their lives.

DISCUSSION

DR. ARCHIBALD MACLAREN, St. Paul: I think Dr. Coventry's position in regard to procidentia uteri is quite sound, and I agree with him in most of the details. I am glad he brought the subject up because it induced me to look up my own results after a good many years, and we do not know exactly what our results are until we do go back and look them up again and find out what the after-results are personally.

I shall confine my remarks practically to Dr. Coventry's last two classes of cases. The first I have not included. First, the Watkins operation. It was about eleven years ago that I did my first operation by the Watkins method for complete procidentia, and that operation has been very satisfactory. I do not think that we should sterilize many women to do this, and in my early experience I sterilized more women by dividing the tubes than I do at the present time. My experience is divided into two stages. First, the stage of enthusiasm, where I did a good many Watkins operations; the last stage when I limited the Watkins operation much more than I did at first, because of the large amount of plastic work required. With modern anterior colporrhaphy you can obtain excellent results much better than those by the old operation where we took an ellipse out of the anterior wall. When we push the bladder clear back and get the fascia underneath the bladder and overlap it, as in a hernia of the anterior wall, we get good results in cystocele, which is the important thing in all procidentia operations.

The interposition operation is better than the Kocher operation where the uterus is taken up and placed in the abdominal wall. I have only done one or two operations of that kind and they were followed by a ventral hernia because they were not properly done; but I have seen the same results in the cases of men better operators than myself.

I have not had any experience with the Murphy operation where he divided the uterus, took out the lining membrane and spread it onto the abdominal wall.

I had a curious experience in trying to do a Watkins operation at the University Hospital many years ago. I started on the anterior wall of the uterus, the patient having been operated on before at the City Hospital in St. Paul, and kept following the uterus until I was up to my elbow, and later, in opening the abdomen, found the uterus was over a foot long; it was fastened in the anterior abdominal wall, and the procidentia had gone on developing and stretched out the uterus.

I looked up the results in a few of my first operations and found one has been cured eleven years, one nine and a half years, one nine years, and one has been cured seven years. Those are the ones that are important because, when we come down to later years, we cannot tell much about the results.

DR. J. W. LITTLE, Minneapolis: I wish to speak very briefly about the fixation operation. I practically abandoned it several years ago, but corroborating the statement made by Dr. MacLaren about the length of the uterus, I had a case some fifteen years ago—maybe twenty years ago—where I fixed the uterus to the abdominal wall, and I heard later from the doctor who brought the patient to me that she was in the same condition as she was before the operation was done. I put the uterus up so tightly against the abdominal wall between the muscles that I did not understand how the uterus could come down. I examined the woman and found the uterus fastened to the abdominal wall proturding from the vagina two or three inches outside of the vulva. If I had a case of that kind, intsead of fixing the uterus to the abdominal wall, I would do a vaginal hysterectomy and bring the broad ligaments together or do a transposition operation.

DR. C. L. RODGERS:, Minneapolis: There is just one point in my limited experience which stands out in this operation, and that is the temptation to either remove your cystocele to the extent that you will encroach on the anterior vaginal wall, or to the extent that you will get a stenosis of the vagina. That point stands out prominently because I have had one experience of that kind which is not particularly satisfactory, and because I have another patient now who has had a similar experience, so that in our desire to eliminate the cystocele we must make allowance for the size of the uterus and not pare off too much of the anterior vaginal wall, or we may get into trouble in many cases. The patient had taken treatment and had the effect of the escharotic as used in these suppositories, and already had atresia well started. I did not make enough allowance with my manipulation to prevent its increasing. That is just one point in the operation that I wish to call attention to.

DR. A. E. BENJAMIN, Minneapolis: I think there is no one thing that has bothered surgeons more than the bad results from operations in cases of prolapse of the uterus, and yet it is a subject to which considerable attention and study has been given. We all know that the operations that have been made by the older men in the profession were performed because the uterus had come down, and in fact a great many women today are of the opinion that this trouble cannot be remedied. They come to us and doubt our statement when we say we can cure them. One woman I operated on a number of years ago said she wished she had known that thirty-five years before.

It has been my custom to classify these cases into two or three types. One class we take before the menopause, and the other class after the menopause. I do not think we can adopt the same operation for the cases that have not passed the menopause as for those that have. Women that have not passed the menopause are likely to become pregnant, so we have no right to sterilize them. I employ a method similar to the one that the doctor described of fixing the uterus to the anterior vaginal wall, bringing the anterior fascia together and fixing the perineum and cervix, and instead of the Baldy-Webster operation, I perform a modified operation whereby I bring the round ligaments in from the abdominal wall and fasten them, spreading them out over the fascia, seeing that there is no strangulation of the ligament, and putting three or four interrupted stitches in the ligament. In those cases we have had satisfactory results. In the cases that have passed the menopause it has been my habit in the last few years in most of these cases to fix up the perineum and vaginal wall and cervix and do a modified Murphy operation. Instead of taking the uterus and bisecting it, we completely remove the fundal portion, leaving the lateral portions to act as supports. This makes, then, firm tissue which you can lap over the recti and fascia and fixing it in a circular manner. There is considerable oozing for a few days but the final results are perfect, and those patients complain less of this operation than the Wertheim-Watkins operation. I have done a number of Wertheim operations, but the patients are not as comfortable I think as after this method. I speak of this as my own experience which has been satisfactory.

DR. A. L. MCDONALD, Duluth: In connection with these cases of prolapse of the uterus, I think the point made by Dr. Benjamin of not sterilizing these patients before the menopause is a good one. We would hesitate to sterilize them and would hesitate to fix the uterus in a woman whom we expected to bear children. I think the first essential thing is a good adequate repair of the perineum, and for that purpose the procedure Dr. Coventry described of suturing the levator muscles and securing good apposition is well adapted. In doing that one should avoid any excessive loss of blood which might lead to the formation of hematoma.

For the intra-abdominal operation I have usually done the round ligament operation of Coffey, namely, fixing the round ligaments across the anterior wall of the uterus and with that cut the layer of the broad ligament. That holds them well up. I have had two or three patients who have gone through pregnancy with the uterus still in good position.

One point in connection with the Murphy procedure of fixing the uterus to the abdominal wall is to have adequate control of the uterine blood supply. I recall seeing two or three of these operations done. I have not done the operation myself. If one in bringing up the uterus ligated the uterine arteries low down, then excised the muscularis thoroughly, bringing up two layers of muscle with very limited blood supply, there would be less disturbance of the anterior wall.

DR. COVENTRY (closing the discussion): I do not know that I have anything in particular to add to what I have already said in my paper. I do not wish you to get the impression that I am in the habit of sterilizing women who come in with prolapse of the uterus of the child-bearing age. There are not many of them that come at that time. However, if a

patient is over forty and is still menstruating, it is seriously to be considered whether it would not be advisable possibly to sterilize her when you are going to do an operation on a uterus that is badly prolapsed and hanging down between the thighs.

VERTIGO. ITS CAUSES AND THEIR DETERMINATION*

By J. A. Watson, M. D., C. M., F. A. C. S.
Minneapolis, Minn.

Of course, we have always understood that vertigo is a symptom, not a disease. Of what it is a symptom, has been however neither clear nor uniform. To the internist it has been largely, perhaps, a symptom of intestinal absorption, arteriosclerosis, or of toxemia of various kinds, to the opthalmologist, of imbalance of the ocular muscles; to the otologist, of circulatory or other disturbances of the labyrinth. But the deeper mechanism of its production in all cases is even now perhaps but rarely understood, and seldom sought after. And yet all who investigate the subject can and must now agree to the simple statement that vertigo is a symptom of perversion of the function of the vestibular apparatus.

Vertigo has been described as "a conscious sensation of motion which is not in accordance with the facts." But it may be and sometimes is merely a sensation of confusion as to one's condition either of motion or of position without any definite sense of motion at all. Indeed this confusion may have as its dominating element a sense of rest as far as one's kinetic relationship with the external world is concerned, a sense of lack of motion, though one may be moving rapidly in a definite direction. It would then be better defined as an erroneous sensation of one's kinetio or static relationship. Such a sensation is always caused by some perversion of the function of the vestibular apparatus. But one must understand the term vestibular apparatus in a complete sense. The conscious sensation of vertigo is of course finally received and recognized in those high centers which preside over the whole kinetio-static sense or seventh sense as it is coming to be called.

Consequently, those centers are as much a part of the vestibular or kinetio-static apparatus as the centers in the cuneus which preside over the sense of sight are a part of the visual apparatus. Naturally also, all the nerve tracts which convey stimuli of whatever kind to those high centers are a part of the apparatus, and this of course includes the various ganglionic areas, or nuclei, or relay stations in which the stimuli are transferred from one part of the tract to another. The receptive end-organs in which these stimuli originate are an essential part of the apparatus. In the widest sense, this includes all the skeletal muscles which have to do with the maintenance or change of postion and the preservation of equilibrium, and the extrinsic muscles of the eyes.

But the semicircular canals and the saccule and utricle of the vestibule are much more essentially the end-organs of the kinetio-static apparatus. There is a very real and important sense in which the labyrinthine apparatus with its directly associated nerve tracts and centers takes precedence over the other organs that have to do with the kinetio-static function, a sense indeed in which it must be considered the essential seat of this function. And this is for two reasons, first, because it is devoted entirely to its purposes. It has taken time to clear away the confusion which at first resulted from that accident of evolution whereby two sense organs, viz. that of hearing, the cochlea, and that of equilibration, the vestibule and semicircular canals, are associated in one anatomical structure, the labyrinth, though just as distinct and independent in their function as are, for instance, the retina of the eye and the Schneiderian membrane of the olfactory apparatus. But it is now thoroughly understood that the cristae of the semicircular canals with the maculae of the saccule and utricle are entirely independent of Corti's organ in the cochlea, have nothing to do with the sense of hearing, and exist solely to subserve the purpose of imparting to the higher centers all necessary information in regard to position and motion. In the second place, this labyrinthine apparatus with its central ramifications is peculiarly and essentially the seat of the kinetic-static sense because under ordinary circumstances stimuli coming from other organs which have a secondary kinetic-static function to perform are referred to it for interpretation and explanation, and because it possesses a very direct and intimate con-

*Read before the Minnesota State Medical Meeting, Oct. 1, 2, 3, 1919, Minneapolis, Minn.

trol over their physiological activity. This is perhaps best exemplified by the uniform obedience of the extrinsic eye muscles to stimuli coming to them from the labyrinthine appratus.

Under normal conditions this obedience is absolute and unvarying, and consists of turning the eyes in the direction of the endolymph flow. If, for instance, the endolymph in the horizontal canal is flowing to the right the eyes will turn horizontally to the right. If the endolymph in the anterior vertical canal is flowing from left to right the eyes will perform a coronal rotation to the right. If the endolymph in the posterior vertical canal is flowing from behind forward the eyes will rotate downward in the sagittal plane and so on. This vestibular pull of the eyes in any certain direction excites a cerebral stimulus which causes a quick jerk of the eyes in the opposite direction. It is this jerking cerebral component of the nystagmus, the movement of recovery, which designates its variety. Thus, if the vestibular pull is to the right, the nystagmus is said to be to the left because the jerking cerebral movement is in that direction.

But while this allusion to nystagmus is necessary owing to its constant physiological association with the organ of equilibrium and its very frequent clinical association with vertigo, it is with the latter of those two great and only reactions to vestibular stimulation that we are now directly concerned. There are no other reactions to vestibular stimulation. Apart from the nystagmus, all the other phenomena such as falling, past-pointing, are directly dependent on the vertigo. One falls in a certain direction because the vertigo from which he is suffering causes him to believe that he is falling in the opposite direction. He points in a certain direction past the object that he wishes to touch, because, owing to his vertigo, he believes he is moving past it in the other direction and consequently reaches back to find it.

In considering, then, the subject of vertigo one must always bear in mind the extensive ramifications and connections of the kinetic-static system. Nature, in her solicitude for the integrity of this function, has provided, not as in the case of sight or hearing, or the other special senses, merely one channel for the conveyance of impressions to the sensorium, but several channels. This solicitude is amply justified by the great necessity for its preservation. A blind or deaf man, or a man both blind and deaf can often still live a useful and happy life, but with this function it can almost be said that we live and move and have our being, and it is hardly possible to imagine life in any highly organized being without it.

With this conception of the function of the kinetic-static apparatus it is not difficult to imagine all the possible causes of vertigo. First, and as far as frequency is concerned, foremost among them is toxemia. I believe that it is not an exaggeration to say that more than one-half of all the cases seeking relief from this symptom owe their vertigo to the circulation of toxins through the vestibular apparatus; I say through the vestibular appartus, for one must remember that unless they reach some part of this system there will be no vertigo though the body should otherwise be full of them.

The remote causes, then, of toxemic vertigo are of course as varied as the causes of the toxemia that produces it. It may come from external sources as in alcoholic or many other poisonings. It may result from faulty metabolism, from the absorption of the poisonous products of imperfect digestion or of intestinal decomposition. Above all it may be from the toxemia of focal infection as in the case of infected tonsils, pyorrhea, apical abscesses, or inflammation of the accessory nasal sinuses. But are there any peculiar characteristics that enable us to distinguish toxemic vertigo from other varieties? Certainly not any which enable us to differentiate it with certainty though I cannot agree with those who state that there is never anything in the character of any vertigo that would suggest its cause, and that one is always at sea about it until one has resorted to the various tests of the vestibular function. If the vertigo is comparatively slight in degree, persistent but rather indefinite in kind without positive sensations of motion in definite directions, if there is no spontaneous nystagmus at any time even during exacerbations of the vertigo, and if the hearing in each ear is normal one would certainly be justified, especially in view of the great prevalence of toxemic vertigo over other forms, in suspecting it strongly enough to cause a search for possible sources of toxin absorption before resorting to the vestibular tests.

To this extent, only, the problem is simplified for the internist and general practioner who have neither the training nor facilities for an examination of the vestibular appartus. But one should not then conclude that because in a given case the vertigo is profound, definite in its characteristics, and even sudden in its onset, it cannot consequently be of toxemic origin. Furthermore, it should be remembered that the access of certain active toxins to the vestibular apparatus, and even the continuous circulation there of less active toxins may gradually or suddenly produce structural changes in its delicate mechanism, in which case there is another and more direct cause for the vertigo.

And indeed we will seldom or never gain any very valuable hints from the character of the vertigo itself when we attempt to differentiate between those cases due to toxemia and that large class of cases arising from circulatory disturbances. These circulatory disturbances may be general in character, disturbances in which the vestibular organs merely share as in anemia, arteriosclerosis or general circulatory insufficiency from heart disease, etc. A great deal of the indefinite dizziness complained of by elderly people is due to arteriosclerosis and when arteriosclerosis is present it may at once be suspected as the cause, though by no means accepted as such. Arteriosclerosis also often results in a definite local lesion such as a hemorrhage into the labyrinth. Or the circulatory disturbances may be due to local conditions, such as adjacent inflammations or tumors or aneurisms affecting supplying vessels. Circulatory disturbances are more likely to be accompanied by tinnitus, especially tinnitus of a more or less pulsating character, than is the case in the vertigo of toxemia.

The third cause of vertigo to be considered is imbalance or paralysis of the extrinsic eye muscles. This causes confusion of the vestibular centers on account of the conflicting sensations conveyed through the eye muscle nuclei to the vestibular apparatus by virtue of the direct connection between them, and possibly on account of conflicting impressions conveyed through association fibres between the visual center in the cuneus and the auditory center in the posterior portion of the temporal lobe. This may be suspected as a cause if the vertigo is relieved by closing the eyes and aggravated by their use. Most other forms of vertigo are apt to be aggravated by closing the eyes. An examination of the eye muscles is then in order. That form of imbalance known as cyclophoria, in which there is a tendency to rotation of the eyes either inward or outward on their antero-posterior axes is especially likely to produce vertigo, because we are especially dependent for correct orientation upon an exact parallelism of the horizontal meridian of the retina with the horizontal plane of the outer world. But very severe vertigo usually results from the apparent doubling of objects which is the result of paralysis of any of the eye muscles.

These, then, are the more important of those causes of vertigo which have their origin in organs more or less remote from the vestibular appratus proper. While they can often be conjectured by a consideration of the attendant circumtances and by an examination of the suspected organ or organs, even their certain determination depends upon a functional examination of the vestibular apparatus.

But in the second class of cases, viz.: those in which the lesion is situated in the vestibular apparatus proper, a diagnosis can never be made without an examination of its function. The lesion may be situated in the labyrinth or in any of the intracranial pathways of the vestibular portion of the auditory nerve. These pathways are now fairly well known. It would be impractical to describe them here, but it may be said briefly that after the auditory nerve enters the upper part of the medulla the three constituent portions of the nerve separate and pursue three different courses upward through the brain stem. The fibres from the vertical canals pass upward in the pons to nearly its upper part where they divide into two branches, one going through the middle cerebellar peduncle to the cerebellar nuclei, the other going through the posterior longitudinal bundle to the eye muscle nuclei. The fibres from the horizontal canals pass immediately to Deiter's nucleus in the posterior external portion of the medulla, one going through the inferior cerebellar peduncle to the cerebellar nuclei, the other passing directly to the posterior longitudinal bundle and the nuclei of the eye muscles. In each case the impulses passing to the eye muscle nuclei have to do with the pro-

duction of nystagmus; those passing to the cerebellum and thence to the higher cerebral centers with the production of vertigo.

Now if it be only remembred, first, that the reactions to the vestibular tests, viz.: nystagmus and vertigo, with all the phenomena arising from the latter depend upon the circulation of the endolymph in the canals resulting from the tests, and second that we can through the tests establish the circulation at will in the canals of any plane to the exclusion of those of other planes, it will at once be seen that we have an important means of localization of the lesion causing the vertigo. If, for example, the hearing is good in the right ear and the horizontal canal of that ear responds normally to the tests for vertigo and nystagmus, but the vertical canals fail to respond, the lesion is probably situated in the pons below the point where the fibres from the vertical canals divide to go to the cerebellum on the one hand and to the eye muscle nuclei on the other. But if on the other hand the right ear be deaf and none of the right canals respond to any of the tests, the lesion is almost surely in the labyrinth itself or in the cerebello-pontine angle or in the auditory nerve before it enters the brain stem.

The tests ordinarily used are of two kinds, viz.: the rotation tests and the caloric tests. In the former the patient is rotated with his head in such a position that the canals to be tested lie in the plane of the rotation. This of course establishes the circulation of endolymph in that particular canal. In the caloric tests the ear is irrigated with hot or cold water. The endolymph in that portion of the canal under test which lies nearest the point of impact of the water becomes heated or chilled depending on whether hot or cold water is used. In the one case of course it rises, in the other sinks and in either case the circulation is thus established.

Lesions of the middle and even external ears, insofar as they are responsible for the production of vertigo may be properly considered under the heading of lesions of the vestibular apparatus itself, because these organs have something to do with the maintenance of proper pressure in the labyrinthine fluid. I have known attacks of severe vertigo to be completely relieved by the removal of impacted cerumen. Sudden increase or decrease of the pressure in the middle ear from any cause may be responsible for profound vertigo even manifesting all the characteristics of Meniere's symptom complex. The vestibular tests in the intervals will provoke perfectly normal reactions and the observer be entirely misled as to the cause of the trouble, as for instance in recurrent attacks of hyperemia of the tube and tympanic cavity. I have seen one such case referred back to the internist by the otologist with the assurance that the cause of the difficulty was not in the ear. Nevertheless, each attack was accompanied by severe tinnitus in the right ear, the hearing in that ear was markedly impaired, and immediately after each attack there was a distinct though slight redness of the drum membrane.

Finally then, and to sum up, it should be today as much the function of the otologist to determine the cause of the vertigo as to determine the cause of the deafness, and quite as much as it is the function of the opthalmologist to determine the cause of blindness. It is perhaps justifiable at times when one has not the training or facilities for making the vestibular tests to attempt a diagnosis by a process of exclusion, narrowing down the possible cause as much as possible by an examination of all the ordinary sources of vertigo outside the labyrinthine apparatus and its intracranial pathways. But such a diagnosis can rarely be final and never so without an examination of the external and middle ears and a determination of the integrity of the sense of hearing, since, on account of the close anatomical association of the organ of hearing and the organ of equilibrium, a lesion of the former in the presence of vertigo should make one doubly suspicious of a lesion of the latter.

DISCUSSION

DR. E. S. STROUT, Minneapolis: Mr. Chairman, Members of the Association: Dr. Watson is to be congratulated on his choice of a subject for the consideration of this Society, and he has given in a clear and concise manner the essential facts regarding the equilibratory apparatus.

This work is so new that it is quite probable that the profession as a whole does not as yet realize the importance of the study of vertigo, not only to the aurist but to every worker in the field of medicine.

Although the fundamental experiments were made by Flourens, nearly 100 years ago, when he noticed striking motor disturbances after sectioning the semi-circular canals in pigeons and rabbits, and that these were associated with nystagmus and vomiting,

it remained for Barany and his co-workers within the past fifteen years, to demonstrate the true function of the semi-circular canals and formulate the laws governing the kinetio-static apparatus.

Prior to that time most physiologists believed that the vestibule as well as the cochlea played some part in the hearing function. Hutchinson's Physiology published forty years ago, says that the vestibule takes cognizance of noise as distinguished from musical sound, and that the office of the semi-circular canals is in part to prevent internal echoes and reverberations.

Michael Foster in his excellent work on physiology published in 1891, states that we have reason to think that the fibers of the vestibular nerve carry impulses which are not auditory in nature, but which affect, in a special way, the movements of the body. He also says that although the vestibule may be injured without any marked effect on hearing, we are not justified in concluding that it does not in any way serve as the channel for auditory impulses. This is of interest in showing the hazy conception of the function of the semi-circular canals and vestibule held by physiologists up to very recent times.

Dr. Watson has made it clear that vertigo may not only be a symptom of a disturbance within the labyrinth, but that this disturbance may be due to disorders of the cranial cavity, or some more remote part of the body. Thus it becomes a valuable aid in diagnosis.

On the other hand the absence of vertigo and nystagmus when they should be present becomes equally important as a diagnostic aid.

I agree with Dr. Watson that the various toxemias are responsible for many cases of vertigo, and that in the milder forms there is little disturbance of hearing, but again we may have marked tinnitus and temporary impairment of hearing from involvement of cochlea as well as the vestibule even in the purely functional cases.

We must also bear in mind the toxemias which produce defininte and permanent impairment of the internal ear, such as the toxins of mumps and syphilis.

The arsenical preparation in large doses may entirely destroy the function of the labyrinth, both for hearing and equilibration. This was frequently noted during the early use of salvarsan.

One important point that I would call attention to is, that while we cannot have vertigo without nystagmus if the vestibular apparatus is intact, we may have nystagmus without vertigo.

I refer to ocular nystagmus which we so often see in persons with poor visual acuity, due to opacities in the media, such as corneal scars. These individuals are unable to fix, and as someone has said, they appear to be trying to look around the obstruction.

The movements of the eyeballs in these cases have been likened to the swing of a pendulum, the oscillations in one direction being just as large and just as rapid as in the other direction, which is as sharp contrast to the rhythmic movements of vestibular nystagmus.

Our first duty when studying a case of vertigo, is to determine whether we are dealing with a functional or an organic change in the internal ear. If the turning and caloric tests give normal reactions as to vertigo and nystagmus, we may assume that no structural change has taken place.

If, then, by further examination we can eliminate middle ear or mastoid disease as causative factors in the production of the vertigo, we know that we must look for some agency acting through the circulation or the nerve pathways upon the equilibratory apparatus in the internal ear.

Structural changes will be shown by variations in or entire loss of, vestibular reaction and these again are due to direct extension of middle ear or mastoid disease to the labyrinth, or toxic products carried to the internal ear by the blood stream or to hemorrhage or effusion.

DR. A. S. HAMILTON, Minneapolis: Chairman, Ladies and Gentlemen: I must say that my ideas are not sufficiently clear to justify me in discussing this paper. I am interested in the subject but have not been able to interpret the result with any particular satisfaction to myself in attempting to localize pathological lesions in the brain. I was closely associated with Dr. Fisher who had much to do with this subject in this community some months ago, but it did not work out very well for me. The thing I am particularly interested in is that the lesions can actually be localized by this method. I saw six cases in the Army who were all referred for tests to see if I could find any evidence of disease, they having shown certain phenomena in this way. In not one of these cases could I get anything out of it. The method may be so delicate that nothing a neurologist can do will show so early a lesion, but I could not find anything in any of the six. I know that two of them turned out to be negative cases; the other four I do not know about.

Another thing is the determination of the pathways in the brain. I do not see how anybody ever determined these pathways. It has been many years since they first started to study these lesions in the brain, and everything has been evolved by many errors and many backward steps. I have seen these moving pictures with the little bodies jumping here and there through the brain, but I do not know how they could tell from that. There is no method for studying sections histologically so far as I know, but we need the facts to show us that these pathways actually exist and that we can rely upon the knowledge that seems to come from them, especially in localization of tumors. I must say frankly that I am unconvinced as to the value of these tests so far as localization is concerned.

DR. J. A. WATSON, Minneapolis. (Closing): I can add but little to what I have already said. I agree in the main with Dr. Hamilton's remarks. I

did not intend to convey the impression that the intracanial pathways of the vestibular nerve fibres were absolutely known. Enough, however, is known about them to be of value in attempting to locate intracranial lesions in which they are involved and they have been discovered in much the same way as other pathways have been discovered. Certainly the post-mortem findings do correspond in many cases with the diagnosis that has been made from the vestibular tests. It is true that the tests often fail and no one would think of depending on them alone for the diagnosis of lesions within the head no more than they would depend on eye symptoms such as choled disc or muscle paralyses for the same purpose. This much I think is practically certain, that vertigo always indicates a disordered function of the vestibular apparatus itself either of the labyrinth or intracranial pathways, from local lesions there or from the circulation of toxins or by conflicting impressions conveyed from other sources. I wish to state that the tests as commonly employed are frequently not exact and painstaking. In many instances the investigator has not even a stop chair, the water is not of the proper temperature, etc. The water should be 68 degrees exactly and when more care is taken and the tests are more exactly carried out, we will gradually find them of more and more value in the determination of the causes of vertigo and even in the location of intracranial lesions.

INJECTION OF GAS INTO THE PERITONEAL CAVITY FOR DIAGNOSTIC AND THERAPEUTIC PURPOSES.*

By A. F. Tyler, B. Sc., M. D.
Omaha, Neb.

It has long been desired that we should have a brilliant method of showing the abdominal viscera, something which could be like the heart contrasted with the air filled lung, or something like the contrast one observes in pneumohydrothorax, where we have fluid contrasted with air and the compressed lung. The method of introducing gas into the peritoneal cavity makes the same or better brilliancy and contrast of the abdominal viscera than that which we have naturally in the pleural cavity.

Historical-Oxygen, as you are doubtless aware, was discovered in 1773 by Scheele of Sweden. A year later, Priesly of England made the same discovery. Shortly after that time, oxygen began to be used by inhalation for certain diseases or by putting patients up in a high altitude for tuberculosis and other pulmonary diseases. I think Bainbridge of New York City was the first in this country to use oxygen in the abdominal cavity for therapeutic purposes. He began about 1903 and carried on a large number of animal experiments relative to the use of oxygen to determine how much pressure could be borne, how many cubic centimeters could be introduced into the abdominal cavity, method of sterilization before injecting the gas, the effect on the pulse, the respiration and the blood pressure. He drew the following conclusions: Oxygen introduced into the abdominal cavity is a cardiac stimulant, also a respiratory stimulant. It brings the patient quickly out from ether anesthesia and at the same time it diminishes nausea and vomiting. He also found it maintained intra-abdominal pressure after the removal of ovarian cysts or abdominal tumors. We know that patients who have large tumors removed from the abdominal cavity go into shock because of the sudden diminution of intra-abdominal pressure and consequent bleeding into the great vessels. This can be prevented by injecting oxygen into the abdominal cavity as soon as the wound is closed and bringing the pressure up to the same point as before the operation. Oxygen introduced into the peritoneal cavity has been found useful in treating tuberculosis of the peritoneum.

The use of oxygen injected into the peritoneal cavity for diagnostic purposes is a recent discovery. The injection of gas into the pleural cavity and examination by X-ray has been used a long time. That of using it in the abdominal cavity was first introduced by Kelling who employed it in two human beings in 1902, one a case of ascites, the other a case of cancer of the stomach.

In 1910 and 1911, Jacobaeus of Stockholm revived the method, performing over twenty experiments on cadavers to determine the safety of penetrating the abdominal wall with a trocar. He was successful in demonstrating gastric cancer, general carcinomatosis and a metastatic growth in the liver. He published a monograph in 1913 describing the results of his work and showing the safety of the procedure in the living subject.

In January, 1912, Weber, working in the

*Read before the Sioux Valley Medical Association January, 1920.

Private Institute for Roentgen Diagnosis of Eugene Weber and V. von Bergman of Kies, noticed how plainly a hypertrophied prostate was visualized when the bladder was filled with oxygen. This led to experiments on cadavers and animals, proving the method of introducing oxygen into the peritoneal cavity helpful in visualizing abdominal organs.

In the same year Lorey introduced air into the abdomen of a case of ascites after withdrawal of the fluid. He demonstrated the spleen, liver and other abdominal viscera to good advantage.

Stewart and Stein of New York began doing the same work in this country in June, 1919. They reported their results in the Annals of Surgery, July, 1919. As often happens in a new thing of this kind, more than one may be working along the same line. In January, 1919, Orndoff of Chicago, did his first case of injecting oxygen into the peritoneal cavity for diagnostic purposes. He had not found any literature and worked on it independently, so he deserves a considerable amount of credit.

Dandy of Johns Hopkins, reported an obscure case which had had a variety of diagnoses including tuberculosis. The patient had some abdominal symptoms so that an exploratory laparotomy was thought advisable. The patient stopped in the X-ray department on his way to the operating room and Baetjer made X-ray plates of his chest. In examining the plates he found they showed a beautiful image of the diaphragm contrasted with gas. Dandy took the patient into the operating room and when the incision was made in the abdomen, he found it filled with gas which had escaped thru the perforation of a large typhoid ulcer of the colon. He immediately began experimental work on diagnosis by means of air injected into the peritoneal cavity of dogs. The result of these experiments was published in the Annals of Surgery September, 1919. Before this, he had injected air into the ventricles of the brain to demonstrate brain tumors. This report was published in the Annals of Surgery, July, 1918.

Dr. Condon of Omaha, has used the injection of a mixture of air and Ringer's solution into the peritoneal cavity for a number of years for the treatment of gastro-mesenteric ileus. Pfahler of Philadelphia, has been using the injection of oxygen into the bladder for diagnostic purposes more than twelve years. This, together with the injection of air into the abdominal cavity, makes it possible to demonstrate the actual thickness of the bladder wall and to reveal tumors when very small.

Technique—One must sterilize the abdominal wall just as carefully as when doing a laparotomy. We use a dental oxygen tank. To this is connected a rubber hose and a spinal puncture needle which has had the point filed blunt. The site of choice for injection is in the midline below the navel, keeping close up to the navel to avoid puncture of the distended bladder. If a scar exists in the midline, one can go thru any other part of the abdominal wall desired. Oxygen is flowed slowly in till the liver dullness is obliterated and the patient complains of feeling full. After air has been introduced, one has to work out a position for bringing the abdominal viscera into view in contrast with the gas. This can best be worked out by having a horizontal table in front of the vertical fluoroscope so that one is looking at the patient laterally with the abdomen up, and as the gas is injected into the peritoneal cavity, the abdominal wall is lifted up and one can see the abdominal viscera contrasted with air. We know when we have injected a sufficient amount by the patient complaining that there is a feeling of fullness. Then we take the needle out and put the patient in the correct position which will reveal the pathology and make plates in this position. This makes it possible for us to actually see adhesions of the viscera to the parietal peritoneum which we were unable to do before by the ordinary method of examination with the opaque meal. Because the cecum was not freely movable, we could infer that adhesions existed, but by this method we can positively demonstrate them.

In place of showing the lower pole of the kidney only, by this method one can show the entire kidney, the entire liver, the entire spleen, and one plate showed the folds of a soft spleen. The injection of oxygen into the peritoneal cavity, together with a gas filled

stomach, enables one to actually demonstrate the thickness of the stomach wall and to visualize gastric tumors and new growths. In some cases, one even gets a very clear image of the gallbladder itself. Air introduced into the bladder and the peritoneal cavity shows the bladder wall, making it possible to visualize tumors when very small. One can visualize the prostate, the pelvic viscera in the female, showing increase in size of the uterus so that pregnancy can be recognized earlier than formerly. Peritoneal tumors can also be shown.

The dangers—First, infection which can be avoided by surgical asepsis. Second, the injection of gas into the subcutaneous tissue. Since absorption quickly takes place, there is no danger unless too much is put in and the distention tears the subcutaneous structures. Third, overdistention of the patient. If one overdistends them the pressure ratio between the thorax and abdomen is changed, causing embarrassment to respiration. Fourth, we may allow the patient to assume the upright position too soon after the injection.

After care—The patient must be kept in the horizontal or Trendelenburg position for twenty four hours. The gas always stays on top no matter what position the patient is in. When erect the gas gets up under the diaphragm, pushing the liver downward, causing a pulling on the supensory ligament with pain in the neck and dyspnea. This causes the patient to want to sit up, thus increasing the distress. By turning the patient upside down, immediate relief is obtained. One must insist on the horizontal position.

Absorption time—The time for the absorption of oxygen in the peritoneal cavity is about thirty-six hours; for carbon dioxide, thirty minutes; air, which is a mixture of oxygen and nitrogen, four to seven days; pure nitrogen, seven to fourteen days.

Up to date, I have used this method of diagnosis in thirty-six different cases. I have found it of great value in making positive diagnosis of adhesions, early uterine enlargement, positive diagnosis of gastric tumors and of gallstones, and it makes it possible to visualize the entire kidney, ovaries and tubes.

Since this method of diagnosis has been used, a new therapeutic use has been found by filling the abdominal cavity with gas to prevent the formation of adhesions between raw surfaces. In order to accomplish this, the oxygen should be injected just before the last stitch is taken in closing up the wound or the needle may be inserted thru the abdominal wall as is done in the usual technique for diagnosis. The abdomen should be distended up to the safety pressure point then the patient should be kept continuously for three or four days in the position which will separate the abdominal wall farthest from the site of the adhesions. One can check up following the operation and see whether adhesions reform.

BIBLIOGRAPHY

Bainbridge, William Seaman—Oxygen in Medicine and Surgery—A Contribution with Report of Cases. N. Y. State Jour. Med., June, 1908.

Bainbridge, William Seaman—Technique of the Intra-abdominal Administration of Oxygen. Am. Jour. Surg., Oct., 1913.

Condon, A. P.—The Treatment of Acute Gastro-mesenteric Ileus. Annals Surg., July, 1919.

Dandy, Walter E.—Pneumoperitoneum. Annals Surg., Sept., 1919.

Dandy, Walter E.—Ventriculography following the Injection of Air into the Cerebral Ventricles. Annals Surg., July, 1918, Vol. 68. Also Am. Jour. Roentgenology, Vol. 6, No. 1, 1919, p. 26.

Goetze, C.—"Die Roentgendiagnostik bei gasgefüllter Bauchhöhle, eine neue Methode." München. Med. Wchschrft., 1918.

Idem—"Ueber Laparo—und Thorakoskopie." Monograph, Wurzburg, 1913.

Jacobaeus, H. C.—"Ueber die Möglichkeit die Cystoskopie bei Untersuchung seröser Höhlungen anzuwenden." Munchen. Med. Wchschrft., 1910. No. 40, p. 2090.

Kelling, G.—"Ueber Oesophagoskopie, Gastroskopie und Coeloskopie." München. Med. Wchschrft., 1902. No. 1, p. 21.

Lorey—"Demonstration einiger seltener Roentgenbefunde." Verhandl. Deutsch. Röntg.—Gesellsch., No. 8, p. 52.

Meyer-Betz, F.—"Methode und Klinische Bedeutung der Darstellung der Leber in Roentgenbild." München. Med. Wchschrft., 1914, No. 15, p. 810.

Orndoff, B. H. Pneumoperitoneum in X-ray Diagnosis—Jour. Roentgenology, Sept., 1919.

Pfahler, Geo. E.—The Injection of Air for the Roentgen Diagnosis of Tumors of the Bladder. Am. Jour., Roentgenology, Aug., 1919.

Rautenberg, E.—Radiological Diagnosis by Means of Pneumoperitoneum. Deutsche Med. Wchschrft., Feb. 20, 1919. Med. Rec., May 10, 1919, p. 798.

Rautenberg, E.—"Roentgen photographie der Leber,

der Milz und des Zwerchfells." Deutsche Med. Wchschrft., 1914. No. 24, p. 1205.

Ribadeau, Dumas L.—Roentgenosocopy of the Viscera after Intra-abdominal Injection of Oxygen. Bul. de la Societe Med. des Hopitaux, Paris, No. 7, 1919, p. 952.

Rosenblatt, J.—Accidental Pneumoperitoneum. N. Y. Med. Jour., Sept. 20, 1919.

Stein, Arthur and Stewart, W. H.—Roentgen Examination of the Abdominal Organs. Annals Surg., July, 1919. Vol. 70, No. 1.

Stewart, W. H.—"Fracture of Skull with Air in Ventricles of the Brain." Am. Jour., Roentgenology, Vol. 1, No. 2, p. 83.

Schmidt, A.—A New Radiological Procedure for Abdominal Diagnosis. Deutsche Med. Wchschrft. Feb. 20, 1919. Med. Rec., May 10, 1919, p. 798.

Tuebern, K. von—Intra-abdominal Injection of Air for Roentgenoscopy. Deutsche Med. Wchschrat. Berlin, Nov. 6, 1919, p. 1242.

Weber, E.—"Ueber die Bedeutung der Einführung von Sauerstoff resp. Luft in die Bauchhöhle für die diagnostische Roentgenologie." Fortschr. a. d. Geb. d. Röntgenstrahlen, 1913, Vol. 20, p. 453.

BLOOD TRANSFUSION AND THE RESULTS THAT MAY BE EXPECTED*

C. Robert Mullong, M. D.
Norfolk, Neb.

Although blood transfusion is by no means a new procedure there is still much to be worked out and perfected before it can be considered beyond its infancy. Whether this slow development is due to a lack of confidence in its merits or the want of a really satisfactory technique for the administering of this valuable adjunct as a therapeutic measure, is something difficult to determine.

It seems now that the decidedly bad effects that are liable to be encountered, and which cause us to dread a blood transfusion, are almost entirely due to faulty technique and have little or nothing to do with haemolysis or agglutination. It also seems that there must be something wrong with the showing of Moss that practically all people are divided into four groups as regards their blood, and that only those should serve as donors whose blood is in the same group as that of the recipient. In a series of one hundred and forty cases, seen during a period of the four years from 1915 to 1919 no ill effects were observed although no discrimination was used in the selection of the donors. In only eighteen cases was the donor a relative of the recipient while the remainder received the blood from the wives, husbands, friends and hired donors. Numerous unpublished reports from all over the country are in accord with this statement and it should not be long before something definite will be brought out along this line.

In the series of cases between 1915 and 1919 anticoagulants were employed in all the work. Hirudin was the anticoagulant in ten cases and sodium citrate was used in the remainder. This rather limited experience, free from any misfortune whatever, has caused us to have utmost confidence in this method and to recommend it as the one of choice.

Sodium citrate must be given the first place as an anticoagulant as it fulfils all the requirements and is less toxic than hirudin. Two-tenths of one per cent sodium citrate solution in accordance with the method of Lewisohn is employed in our work.

Certain things should be kept in mind, however, when a blood transfusion is performed. The donor must be a healthy individual, free from syphilis, gonorhea, tuberculosis, or any other serious ailment. The blood should be given slowly and kept at a temperature of one hundred degrees. To facilitate this we devised a special apparatus in 1915 which has up to this time, not found its way onto the market. This apparatus is a glass tube, somewhat like the one devised by Percy, with a capacity of five hundred cubic centimeters and constructed of quite heavy glass and is encased in a second equally heavy glass tube with a capacity of seven hundred cubic centimeters. The outer tube has an opening at the upper end which can be closed with an ordinary cork stopper after the compartment has been filled with water of a temperature of 101 degrees. The upper end of the inner tube has a slip-on point for a rubber tubing with bulb attached. The lower end of the inner glass is drawn to a finer point than the upper and to this is attached a small rubber tube with a luer tip for the needle. It also has a cut-off so the flow

*Read before the Sioux Valley Medical Society, Sioux City, Iowa, Jan. 21, 1920.

of blood may be stopped or regulated as desired.

This apparatus has been in use for four years and has given most gratifying results. It tends to eliminate many of the disagreeable effects that are so liable to make themselves felt during the preformance of a blood transfusion.

When the blood is being drawn into a vessel and mixed with the anticoagulan solution it has an opportunity to cool considerably but the water coat of 101 degrees brings it back to a temperature of about 100 degrees soon after it is placed in the tube. It is wonderful how much the warming of the blood adds to the patient's comfort as well as adding ease to the performance of the operation.

The blood is kept under a constant pressure with the bulb on one end of the tube and the cut-off on the other. This eliminates the annoyance of stoppage of the flow which frequently occurs, even with citrated blood, when the gravity method is used.

The blood should be drawn with a needle and also given with a needle in one of the largest veins that presents itself at the bend of the elbow. The only marks indicating that an operation was done should be a needle puncture on the arm of the donor and on the recipient except in cases of prenicious anemia, when intending to give a large amount of blood ,a quanity of the watery contents is withdrawn from the other arm.

A series of thirty cases under our care previous to 1915 received transfusions of blood that was not treated with anticoagulants. These were given by the direct and indirect methods with varying results. One patient died during the operation. At postmorten small clots or thrombi were found at the bifurcations of many of the large arteries, while some of the small arteries were completely obliterated. These thrombi may have been due to agglutination but it would probably be just as correct to assume that they were the result of coagulation. In others of this series some very peculiar symptoms were observed. Some of the most marked were violent headache, rise in temperature, retinal congestion, edema of the glottis and uvula, extreme nervousness and violent twitching simulating convulsons. None of these bad effects have been encountered since resorting to the use of blood treated with anticoagulants.

Very gratifying results may be anticipated and are often obtained in any form of anemia, purpura or hemophilia. In fact any abnormal blood condition will yield in degrees from slight benefit to complete recovery. It appears, however, that blood transfusion is not as valuable in severe acute hemorrhages as is generally anticipated. Where there has been a loss of an abundance of blood a great deal more can be accomplished by transfusing a considerable quantity of normal salt solution than by waiting and performing blood transfusion. To prepare to give blood nearly always necessitates some delay. A salt solution can be quickly given and will do much to tide the patient over for a blood transfusion later.

Probably the greatest satisfaction is attained when blood transfusion is used as a treatment adjunct for pernicious anemia. In our work sixty cases of this affection were treated in this manner between 1915 and 1919 three proving fatal. One of these cases had a red blood count of 800,000 per cubic millimeter when treatment began. The other two fatal cases each had a count of 1,000,000 red blood cells to the cubic millimeter at the time they came under our observation. The lowest fall of the count in these cases that recovered was 1,200,000 per c.m.m. In spite of the small number of patients treated, figures like these are important for the reason that they show that to obtain the best results, treatment should not be delayed too long.

In our cases the amount of blood given at the first operation was usually 1000 cubic centimeters, with the letting at the same time of about 700 c.c. of the anemic contents from the vein in the opposite arm. The withdrawing of blood was not repeated at subsequent transfusions which were usually performed at three day intervals.

Counts were made every three hours after transfusion was made and at the end of the first three hours after the initial transfusion a rise in the number of corpuscles of between 30,000 to 50,000 was found in most of the

cases. After the first three hours the rise was less marked, ranging from a decrease to as high as 20,000 increase. This condition, with possibly a slight increase in numbers, existed until the next transfusion three or four days later. Then practically the same changes took place as those following the first operation except that there was no fall in the count at the end of the first three hours and the increase was more pronounced after that.

MINNESOTA MEDICINE

Owned by
The Minnesota State Medical Association.

PUBLISHED BY ITS EDITING AND PUBLISHING COMMITTEE

R. E. Farr, M. D. Minneapolis
H. Longstreet Taylor, M. D St. Paul
L. B. Wilson, M. D. Rochester
F. L. Adair, M. D. Minneapolis
J. T. Christison, M. D., St. Paul

EDITORIAL OFFICE
CARL B. DRAKE, M. D., Editor
1300 Lowry Bldg., St. Paul

BUSINESS MANAGER
J. R. Bruce, 403 Central Bank Bldg., Saint Paul
Telephone: N. W. Cedar 1683

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.
All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $3.00 per annum in advance. Single Copies 25c Foreign Countries $3.50 per annum.

Vol. III Juue, 1920 No. 6

EDITORIAL

MEDICAL PLAGIARISM

Plagiarism is defined as "the appropriation or giving out as one's own the literary or artistic work of another". A polite term for theft, then. And plagiarism occurs too often in the field of medicine and cannot be too severely condemned.

Few ideas are original if we accept Kant's view that the source of man's knowledge is experience. Few individuals have the inventive type of mind. Most of us pick and choose from the ideas and inventions of others. And most of the new ideas do not stand the test of time.

Medical literature is largely composed of old ideas presented in new form or in different combinations. What an economy would be effected if only strictly new medical matters were published. And yet this rehashing of ideas and the recording of one's experience has the same value as discussion in general.

An author would have some difficulty oftimes in giving his authority for numerous ideas expressed. One need not be absurd in his conscientious endeavor to give honor where honor is due. The boundary line of plagiarism is generally clear cut and can be determined by the application of the Golden Rule.

You do not want another to quote sentences or whole paragraphs from you simply exercising a more or less liberal editorial prerogative. You much prefer that your name be mentioned and quotation marks retained, even though your literary style may not be of the best. If you have actually invented some diagnostic procedure or mechanical device it would be galling to have your idea stolen and presented by another.

No international police as yet exists and the chance of detection is apparently judged to be less, the farther away the stolen goods are carried. The world is not so large after all.

TONSILS AND TEETH.

The crux of the tonsil and tooth question is not so much whether definitely diseased tonsils or abscessed teeth should be removed but when does pathology in these organs warrant removal.

About a decade ago attention was called by laboratory investigators to the etiological relation of infections of the tonsils to a host of morbid processes in other organs. War was declared on the tonsil and tonsils were more often than not removed because they "looked bad" to the specialist. Occasionally hidden diseased tonsillar foci were found and this possibility loomed up in every case examined and tonsils were slaughtered largely because they were tonsils, the anamnesis as likely as not being ignored.

The medical profession first called attention to the importance of diseased tooth roots as foci of infection. The dentist was called upon to remove abscessed roots in the interest of the patient's general health. He balked, being naturally loath to tear down his bridge work and remove his crowns. But what a change in the attitude in the dental profession. Dental surgeons, zealous to assist the medical profession, arose like mushrooms. In case of doubt, extract—became their motto. Some dentists became so conscientious that they refused to fill a dead tooth and referred such cases to men that would. The onslaught on teeth outdid that on the tonsil. The question has been and still is a difficult one, notwithstanding our remarks.

There is no doubt but that the medical profession is now trying to modify the attitude of

the extremists in the dental profession on the extraction problem. In fact the pendulum has begun to swing back toward its position of rest. Probably fewer tonsils are being removed of late just as in the case of appendix.

In an effort to put the brake on this backward swing of the pendulum and bring us as a profession to that ultimate moderate view point, attention is called to some very interesting observations recently made by no less an authority than Dr. Alexander Lambert of New York, regarding the prevalence of acute rheumatic fever at Bellevue Hospital. His careful survey leaves no room for doubt but that there has been a marked decrease in the number of these cases during the past few years, the last two particularly. He feels that the attention directed to both tonsils and teeth is to be credited with this result. Not tonsils alone, as this reduction though more marked in the age period 20 to 29 is not confined to this period. This is the period affected by tonsillectomy in children, a popular proceeding only during the last ten years.

If an individual has a repeated tonsillar infection at a comparatively short interval, the tonsils should come out. If the dentist finds an abscessed tooth root the extraction should be performed and the socket curetted. The question, abscess or no abscess should be determined by the dentist. The dark circular area of deeper x-ray penetration about a tooth root should not be the only consideration. Shadow projection is tricky at times. The vitality of the tooth is an important consideration and each case should be considered on its own merits with due regard for disease elsewhere. Temporizing measures however, simply postpone extraction and are dangerous.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MID-SUMMER SESSION SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Fairmont, Minnesota, June 28-29, 1920

OFFICERS

Dr. H. Z. Giffin, Pres., Rochester, Minn.
Dr. Archa E. Wilcox, 1st V. P., Minneapolis, Minn.
Dr. W. J. Richardson, 2nd V. P., Fairmont, Minn.
Dr. H. T. McGuigan, Sec., Red Wing, Minn.
Dr. G. F. Merritt, Treas., St. Peter, Minn.
Mr. William Whitford, Official Reporter, Chicago.

ANNOUNCEMENTS

The afternoon session will convene Monday, June 28th at 2:30 o'clock P. M. at the auditorium High School Building.

The banquet will be held Monday evening, Gymnasium High School Building, at 6:30 P. M.

Please make your reservations for plates and hotel accommodations at once by addressing Dr. W. J. Richardson, Chairman, Committee of Arrangements, Fairmont, Minnesota.

The Automobile Tour will be given Tuesday afternoon, June 29th. Hour to be announced later.

The Luncheon by the Physicians and Citizens of Fairmont will be tendered Tuesday, June 29th. Hour to be announced later.

The Fairmont Golf Club has Reserved the Golf Links for the exclusive use of Visiting Physicians and their Friends, Monday forenoon, June 28th, Tuesday afternoon, June 29th and Wednesday, June 30th.

Physicians and Ladies desiring to participate in the Golf Tournament should communicate with Mr. Troy Himmelman, Fairmont, Minnesota.

All railroads making Fairmont will carry special coaches on all regular passenger trains, Monday, June 28th. Schedule of train service will appear in the Official Program, June 15th, 1920.

Application for membership in the Southern Minnesota Medical Association may be made to Dr. H. T. McGuigan, Red Wing, Minn.

AFTERNOON SESSION

AUDITORIUM HIGH SCHOOL
MONDAY AFTERNOON, JUNE 28, 1920
2:30 O'CLOCK P. M.

1: Fracture Sprain (Lantern.)—Dr. A. E. Sohmer, Mankato, Minn.

Discussion:—Dr. A. R. Colvin, St. Paul, Minn.; Dr. M. H. Cremer, Red Wing, Minn.

2. Ocular Imbalance (Heterophoria.)—Dr. J. H. James, Mankato, Minn.

Discussion:—Dr. John Fulton, St. Paul, Minn.; Dr. Jehiel Chamberlin, St. Paul, Minn.

3. A Consideration of Late Sequela Following Gastroenterostomy, With Special Reference to Gastrojejunal Ulcer—Dr. George Eusterman, Rochester, Minn.

Discussion:—Dr. Hugh S. Willson, Minneapolis, Minn.; Dr. E. L. Tuohy, Duluth, Minn.

4. Mechanics of Digestion—Dr. Charles N. Hensel, St. Paul, Minn.

Discussion:—Dr. C. P. Robbins, Winona, Minn.; Dr. R. M. Wilder, Rochester, Minn.

5. Chronic Interstitial Nephritis in Children—Dr. Rood Taylor, Minneapolis, Minn.

Discussion:—Dr. L. G. Rowntree, Minneapolis, Minn.; Dr. N. O. Pearce, Minneapolis, Minn.; Dr. R. N. Andrews, Mankato, Minn.

6. Treatment Acute Septic Arthritis—Capt. Vandervelt, La Panne, Belgium.

Discussion:—Dr. A. A. Law, Minneapolis, Minn.; Dr. Wallace Cole, St. Paul, Minn.

EVENING SESSION

AUDITORIUM HIGH SCHOOL

MONDAY EVENING, JUNE 28, 1920

6:30 O'CLOCK P. M.

Address of Welcome—Mayor J. E. Edwards.

Response—Dr. W. A. Jones, Minneapolis, Minn.

Invocation—Rev. F. S. Fredrickson, Fairmont, Minn.

Banquet.

7. Differential Diagnosis of Bronchiectasis, Lung Abscess and Encapsulated Empyema—Dr. C. P. Howard, Iowa City, Iowa.

Discussion:—Dr. C. A. Hedblom, Rochester, Minn.; Dr. J. P. Schneider, Minneapolis, Minn.

8. Methods of Education in South America, with Observations on the Universities, Hospitals, Surgical Clinics and Surgeons—Dr. William J. Mayo, Rochester, Minn.

9. Diagnosis and Treatment of Acute Anterior Urethritis (Lantern.)—Dr. Lewis Wyne Bremerman, Chicago, Ill.

Discussion:—Dr. S. E. Sweitzer, Minneapolis, Minn.; Dr. Paul Cook, St. Paul, Minn.

10. Ankylosis of the Jaw (Lantern.)—Dr. Harry P. Ritchie, St. Paul, Minn.

Discussion:—Dr. G. B. New, Rochester, Minn.; Dr. A. L. Mann, Minneapolis, Minn.

TUESDAY, JUNE 29, 1920

8 O'CLOCK A. M.

11. Diabetes Mellitus—Dr. L. G. Rowntree, Minneapolis, Minn., Professor of Medicine, University of Minnesota.

Discussion:—Dr. James Gilfillian, St. Paul, Minn.; Dr. Marx White, Minneapolis, Minn.

12. Pre and Post-Operative Medical Considerations in Diabetes with Surgical Complication—Dr. D. M. Berkman, Rochester, Minn.

Discussion:—Dr. J. W. Little, Minneapolis, Minn.; Dr. Harry B. Zimmerman, St. Paul, Minn.

13. Tuberculosis of Knee Joint in Children—Dr. M. S. Henderson, Rochester, Minn.; Dr. H. W. Meyerding, Rochester, Minn.

Discussion:—Dr. Emil S. Geist, Minneapolis, Minn.; Dr. A. J. Gillette, St. Paul, Minn.

14. Sensory Changes in Pernicious Anaemia—Dr. Arthur S. Hamilton, Minneapolis, Minn.

Discussion:—Dr. H. W. Woltman, Rochester, Minn.; Dr. E. M. Hammes, St. Paul, Minn.

15. The Organization of Medical School and Hospital Facilities for Graduate Medical Education—Dr. L. B. Wilson, Rochester, Minn.

Discussion:—Dr. E. P. Lyon, Dean University Medical School, Minneapolis, Minn.

Committee on Arrangements

Dr. W. J. Richardson, Fairmont, Minn., Chairman.
Dr. H. P. Johnson, Fairmont, Minn.
Dr. George W. Dewey, Fairmont, Minn.

Reception Committee

Dr. G. H. Luedtke, Fairmont, Minn., Chairman.
Dr. F. N. Hunt, Fairmont, Minn.
Dr. R. C. Lowe, Fairmont, Minn.
Dr. R. C. Farrish, Sherburn, Minn.
Dr. P. F. Holm, Wells, Minn.
Dr. C. J. Holman, Mankato, Minn.
Dr. W. C. Portman, Jackson, Minn.

Executive Committee

Dr. W. F. Braasch, Rochester, Minn., Chairman.
Dr. C. P. Robbins, Winona, Minn.
Dr. W. H. Rowe, St. James, Minn.

Committee on Nominations and New Members

Dr. J. H. Adair, Owatonna, Minn., Chairman.
Dr. M. S. Henderson, Rochester, Minn.
Dr. W. H. Condit, Minneapolis, Minn.

Program Committee

Dr. A. F. Schmitt, Mankato, Minn., Chairman.
Dr. H. W. Meyerding, Rochester, Minn.
Dr. E. M. Hammes, St. Paul, Minn.

SIOUX VALLEY MEDICAL ASSOCIATION

The twenty-fifth annual session of the Sioux Valley Medical Association will be held in Sioux Falls, South Dakota, June 23 and 24, 1920.

PROGRAM

JUNE 23, 1920

Cardiac Diagnosis. Dr. E. W. Meis, Sioux City, Iowa.

Cardiac Asthenia. Dr. V. W. Embree, Yankton, South Dakota.

Subject to be announced. Dr. J. C. Ohlmacher, Vermilion, South Dakota.

Xray Study of War Fractures and Osteomyelitis. Dr. N. J. Nessa, Sioux Falls, South Dakota.

Empyema. Dr. P. E. Sawyer, Sioux City, Iowa.

President's Address. Dr. A. E. Spalding, Luverne, Minnesota.

The Sioux Valley Medical Association. Dr. J. N. Warren, Sioux City, Iowa.

Diagnosis and Treatment of Weak and Flat Feet. Dr. W. E. Wolcott, Omaha, Nebraska.

Tibial Bone Defects, Congenital and Acquired. Dr. J. P. Lord, Omaha, Nebraska.

Cystoscopy in General Abdominal Diagnosis. Dr. C. T. Maxwell Sioux City, Iowa.

A Few Interesting Cases. Dr. L. J. Townsend, Sioux City, Iowa.

JUNE 24, 1920

Traumatism and Transplantation in Cancer. Dr. D. T. Quigley, Omaha, Nebraska.

Gastric Ulcer and Gastric Malignancy. Dr. J. W. Shuman, Sioux City, Iowa.

Practical Infant Feeding without Breast Milk. Dr. F. Clark, Omaha, Nebraska.

Child Welfare. Dr. G. E. Limmerman, Sioux Falls, South Dakota.

Great Men in Medicine. Dr. J. H. Darey, Sioux City, Iowa.

Banquet at Hotel Cataract, Wednesday, June 23, 1920 at 7 P. M.

OFFICERS

President, Dr. A. E. Spalding, Luverne, Minn.

Vice-President, Dr. E. A. Jenkinson, Sioux City, Iowa.

Second Vice-President, Dr. T. J. Billion, Sioux Falls, South Dakota.

Secretary, Dr. J. A. Dales, Sioux City, Iowa.

Treasurer, Dr. W. R. Brock, Sheldon, Iowa.

COMMITTEE OF ARRANGEMENTS

Drs. G. G. Gottam, F. I. Putnam, N. J. Nessa, Sioux Falls, South Dakota.

NEW AND NON-OFFICIAL REMEDIES

During April the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Abbott Laboratories:
- **Anesthesin-Abbott**
- **Aromatic Chlorazene Powder.**
- **Tablets Dichloramine-T-Abbott.**

Diaprotein Company:
- **Diaprotein Prepared Casein Flour.**

Gilliland Laboratories:
- **Streptococcus Vaccine (Gilliland).**

Heyden Chemical Works:
- **Acetylsalicylic Acid-Heyden.**

Hollister-Wilson Laboratories:
- **Capsules Corpora Lutea Desiccated-Hollister-Wilson.**
- **Tablets Corpus Luteum Desiccated-Hollister-Wilson.**
- **Pituitol Obstetrical.**
- **Pituitol Surgical.**

Lederle Antitoxin Laboratories:
- **Pollen Antigen-Lederle (Spring Type).**

Lowy Laboratory, Inc.:
- **Solution Arsphenamine-Lowy.**

Radio Chemical Corporation:
- **Radium Bromide (Radio Chemical Corp.)**
- **Radium Carbonate (Radio Chemical Corp.)**
- **Radium Chloride (Radio Chemical Corp.)**
- **Radium Sulphate (Radio Chemical Corp.)**

E. R. Squibb & Sons:
- **Bacillus Bulgaricus-Squibb.**

Bacillus Bulgaricus-Squibb.—A culture in vials of the bacillus bulgaricus type A, the bacillus bulgaricus type B (bacillus acidophilus) and the bacillus paralacticus, each vial containing 12 Cc. The preparation is designed for internal administration and for topical application (see general article, Lactic Acid-Producing Organisms and Preparations, New and Nonofficial Remedies, 1920, P. 156). E. R. Squibb & Sons, New York.

Pollen Antigen-Lederle (Spring Type).—A liquid obtained by extracting equal parts by weight of dried pollens of timothy, red top, June grass, orchard grass, sweet vernal grass, meadow foxtail, meadow fescue, rye and wheat by a vehicle of 67 per cent glycerine and 33 per cent saturated solution of sodium chloride. Each Cc. contains 14,000 pollen units (a pollen unit is the equivalent of 0.001 Mg. of pollen). For a discussion of the actions, uses and dosage, see Pollen Extract Preparations, New and Nonofficial Remedies, 1920, p. 236. The product is supplied in 15 different doses, each dose consisting of 0.1 Cc. of the respective dilution. Each dose is accompanied by a vial containing 9 Cc. of sterile water for diluting the dose to make it of isotonic strength. Pollen Antigen-Lederle (Spring Type) is supplied in packages containing a complete set of 15 doses, in packages containing sets of 5 doses and as a diagnostic test consisting of 0.01 Cc. of No. 15 dilution. Lederle Antitoxin Laboratories, New York (Jour. A. M. A., April 24, 1920, p. 1167).

PROPAGANDA FOR REFORM

Some Misbranded Nostrums.—The following "patent" medicines have been the subject of prosecution by the Federal authorities: Mendenhall's No. 40 for the Blood, consisting essentially of potassium iodid, cathartic resins, ammonium acetate, licorice, glycerin, sugar, alcohol and water; Zaegel's Essence, consisting essentially of alcohol, water, sugar and plant extractives, including a laxative substance and a saponin; Zaegel's Lung Balsam, consisting essentially of alcohol, water, sugar and laxative plant material flavored with oil of peppermint; McGraw's Liquid Herbs of Youth, containing essentially Epsom salt, senna, red pepper, quassia, alcohol and water with wintergreen flavor; Jarabe de Abrozoin, composed essentially of terpin hydrate, menthol, benzoic acid, ammonium chlorid, sodium bromid, glycerin, alcohol, sugar and water; Kampfmueller's Rheumatic Remedy, consisting essentially of potassium iodid, plant extractives, alcohol and water; Sal-Sano, containing essentially sodium chlorid, sodium phosphate, sodium bicarbonate and sodium sulphate; Indian Wyanole, consisting essentially of chloroform, ammonia, menthol, glycerin, turpentine-like oils, alcohol and water;

Gregory's Antiseptic Oil, consisting of kerosene oil with oil of cloves, cassia, and sassafras with a trace of camphor and pepper resins (Jour. A. M. A., April 17, 1920, P. 1114).

Look Up Its Rating.—The Council on Pharmacy and Chemistry was created because the complexity of modern medicine makes it a physical impossibility for physicians to know the scientific status of the many proprietary remedies which are on the market. As commercial agencies, such as Bradstreet and Dun, report on the commercial probity of individuals and firms, so the Council on Pharmacy and Chemistry reports on what might be called the scientific probity of proprietary and unofficial pharmaceutical products. The commercial agency issues, at no small expense to its customers, rating books; the Council on Pharmacy and Chemistry issues, at a nominal price, "New and Nonofficial Remedies". The commercial agency, for a substantial fee, will furnish reports on business concerns; the Council on Pharmacy and Chemistry, will without any expense to the profession, furnish reports on proprietary products used for the relief or cure of human ailments (Jour. A. M. A., April 24, 1920, p. 1171).

Adulterated or Misbranded Mineral Water.—Harris Spring Water, examined by the U. S.. Bureau of Chemistry, was found to contain B. coli in small quantities, molds and liquefying organisms. Sprudel Concentrated Spring Water was found to contain bacilli of the colon group and also added salts not obtained from the West Baden Springs. American Apollinaris Mineral Water was found not to be Apollinaris Water. Robinson Spring Water was falsely claimed to be effective as a remedy for Bright's disease, diabetes, dropsy, cystitis, gout, rheumatism, indigestion, and kidney and bladder troubles. Ferro-Manganese Regent Water was falsely represented as a remedy for alcoholism, chronic rheumatism, dyspepsia, diabetes, Bright's disease, albuminuria, dropsy, sciatica and insomnia, and was not a natural spring water (Jour. A. M. A., April 24, 1920, p. 1182).

Alkalithia.—Keasbey and Mattison Company's Effervescent Alkalithia was introduced at a time when it was believed that the administration of lithium salts served to remove uric acid from the system. The A. M. A. Chemical Laboratory reported that Alkalithia is an effervescent mixture which contains alkaline carbonates and bicarbonates together with caffein, free tartaric acid and free citric acid and that, as taken, it represents caffein in solution of alkali tartrate, citrate and bicarbonate containing free carbonic acid. The Council on Pharmacy and Chemistry declared Alkalithia inadmissible to New and Nonofficial Remedies because the claims made on the label and in the circular accompanying the trade package led the public, to its detriment, to depend on this preparation and because the therapeutic claims are unwarranted (Reports Council Pharm. & Chem., 1919, p. 65).

Arhovin Omitted from N. N. R.—Arhovin is a solution of diphenylamin, thymol benzoate and ethyl benzoate marketed by Schering and Glatz, Inc. The Council on Pharmacy and Chemistry reports that it was omitted from New and Nonofficial Remedies because the therapeutic claims made for the preparation were unwarranted (Reports Council Pharm. & Chem., 1919, p. 66).

Chloron, Chlorax and Number "3".—The Council on Pharmacy and Chemistry has examined Chloron, Chlorax and Number "3", manufactured by the Chlorine Products Company, Inc., New York. The products have been declared inadmissible to New and Nonofficial Remedies. The report of the Council—which in accordance with the usual procedure was submitted to the Chlorine Products Company before its publication was authorized—sums up the Council's findings thus: (1) All are of unreliable composition. (2) The therapeutic claims made for the preparations are not substantiated by evidence and are unwarranted and misleading. Chloron is inferior as an antiseptic to the well-known surgical solution of chlorinated soda because of its low chlorin content and uncontrolled reaction. There is no warrant for the claim that Chlorax is useful in the treatment of "Kidney Conditions", "Diabetes", "Acute Infections", "Blood Dicrasias", "Lithemias" and "Rheumatism", and "Nervous Conditions", nor is there warrant for the claim that "Number '3' " is a "blood purifier" or a "syphilis remedy". (3) The names of these pharmaceutical mixtures are not descriptive of their composition. (4) All three preparations are irrational. No evidence has been furnished that the lithium salt is of value in the mixtures. It is not rational to combine an active chlorin preparation and a mercury salt in one mixture, nor is there evidence that the addition of opium to the preparations proposed for internal use is of value or rational. Experimentation with Number "3" as a "syphilis remedy" is to be severely condemned in that those on whom it is used will, in the meantime, be deprived of efficient medication (Reports Council Pharm. & Chem., 1919, p. 70).

Elarsen Omitted from N. N. R.—Elarsen, now sold by the Winthrop Chemical Co., Inc., was formerly sold in the United States by the Bayer Co., Inc. It was admitted to New and Nonofficial Remedies in 1914. The Council on Pharmacy and Chemistry now reports that Elarsen has been omitted from New and Nonofficial Remedies because it is sold under unproved and, consequently, unwarranted claims and because, in the light of investigation, it is an unscientific and relatively useless article. The Council also reports that Elarsen has not been shown to have advantages over Fowler's solution but that, in some respects at least, it is inferior (Reports Council Pharm. & Chem., 1919, p. 75).

Formicin Omitted From N. N. R.—Formicin, manu-

factured by Kalle and Co., A. G. Biebrich A RH, Germany (Kalle Color and Chemical Co., New York, U. S. agents) was admitted to New and Nonofficial Remedies in 1912. The Council on Pharmacy and Chemistry reports that while the claims recently made for Formicin were essentially those made when the product was first accepted, these claims were questioned because further experience had not established the usefulness of the product. As the Kalle Color and Chemical Co. presented no evidence to establish its therapeutic efficiency, the Council directed the omission of Formicin from N. N. N. (Reports Council Pharm. & Chem., 1919, p. 76).

CORRESPONDENCE

Ductless Gland in U. S. Soldiers During the European War

Army Medical Museum, Washington, D. C.
May 11, 1920.

To the Editor:

Being interested in material on diseases of the glands of internal secretion in U. S. soldiers in our army camps and at the front during the European War, I should feel much indebted to any physician who has served as a medical officer in the Army during the war, who might be able to supply me with any information in regard to this matter, particularly statistical relations, comeiology, the incidence of these diseases in drafted men and in enlisted men who were subsequently on duty, and the measures taken in dealing with such cases. Any help I may receive in this matter will be highly appreciated and acknowledged.

James Robb Church,
Colonel, Medical Corps, U. S. Army,
Secretary-Treasurer.

OBITUARY

DR. HERBERT S. HILL.

Dr. Herbert S. Hill, formerly of Owatonna, died April 1st at his home in Springfield, Mo. He was 77 years of age, and was born at Buxton, Me. He was a graduate of the Rush Medical College. After graduation he practiced medicine at Elkader and Dubuque, Ia., moving to Owatonna in 1873. In 1884 he moved to Springfield, Mo., where he has since made his home. His widow and one brother survive him.

DR. L. A. DAVIS.

Dr. L. A. Davis of Wadena died on April 22. He was born at Harnesville, Pa., June 19, 1878, and came to Minnesota with his parents in 1882, when they settled at Howard Lake, and there he received his early education. In 1901 he graduated from the medical school of the University of Minnesota and took his interne work in the Norwegian Deaconess Hospital in Minneapolis, after which he took up practice at Dalton. A short time after locating at Dalton, Dr. Davis moved to Wadena where he has practiced since. He is survived by his widow and three children.

DR. BENJAMIN F. MOTT.

Dr. Benjamin F. Mott died at his home in Minneapolis at the age of 60 years. Dr. Mott was a graduate from the Eclectic Medical College of Cincinnati in 1874. About twenty-five years ago he practiced in Lake City.

DR. JOHN STEINBACH.

Dr. John Steinbach died at his home in Winona on April 28th at the age of 64. He was a well known oculist and has practiced in Winona for twenty-nine years. He is survived by his widow and two children.

DR. ALFRED WHARTON.

Dr. Alfred Wharton, aged 84 years, died at the residence of his daughter Mrs. John W. Willis, 923 Summit Ave., St. Paul, on April 13, 1920. Dr. Wharton graduated at the University of Pennsylvania in 1857 and came to St. Paul shortly after graduation, arriving on the same boat as the late Dr. D. W. Hand. Dr. Wharton practiced his profession in St. Paul from that time till he retired from active practice in 1885, though for some years after that he did some office consultation and was medical examiner for several life insurance companies.

He was associated at different times with Dr. W. H. Morton, a prominent surgeon here in the late fifties and sixties of last century, Dr. John H. Murphy and Dr. Samuel Willey. Dr. Wharton also served as surgeon to the 6th Minnesota Infantry having been appointed to that position by Governor Ramsey in 1862. Dr. Wharton's death removed from St. Paul the last of our profession who practiced here in the pioneer days. He was a member of the old St. Paul Academy which organization flourished about the period of the Civil War and also was one of the founders of our present State Medical Association and of the Ramsey County Medical Society, having been vice president of the former and president of the latter. Of the original group of men who organized the Ramsey County Medical Society but three now remain, Dr. Samuel D. Flagg, who came here in 1868, Dr. Brewer Mattocks, who came here in 1859 as a druggist but who did not practice medicine till some years later and Dr. Charles E. Smith, Sr. Drs. Flagg and Smith reside here, the former still in active practice while Dr. Mattocks lives in Pittsburg, Pa.

Dr. Wharton married Miss Susan Budd of Philadelphia who died in 1890.

MINNESOTA PUBLIC HEALTH ASSOCIATION COLUMN

By H. W. Hill, M. D.
Executive Secretary, M. P. H. A., Shubert Bldg., St. Paul, Minn.

Medicals "Making Friends" With the Public, Suggestion No. 1.

"Can't be done?" It has been done. Here are the facts. On January 15, 1920, all unknown to those concerned, there worked itself out a curiously simple beginning which has the germ of a revolution in it. The Goodhue County Medical Society set that date for its regular monthly meeting. A speaker on Public Health from the Twin Cities was secured. So far so good, and perfectly ordinary.

But the suggestion came then that the Goodhue County Public Health Association, a lay organization, the local branch of the Minnesota Public Health Association, should be invited to the Goodhue County Medical Society meeting to hear this speaker.

It was clearly understood that when the Public Health address was finished the laymen would depart, and the medicals would go on with their ordinary technical program.

These plans were carried out as arranged, up to the point where the popular address was finished. Plenty were present of laymen, laywomen, laychildren connected with the County Public Health Association —more than there were of medicals. But when it was announced by the president of the Medical Society that the popular part of the program was ended, and that those who did not care for the technical papers were at liberty to depart, scarcely a soul departed! Rather taken aback, the medicals hesitated, but at last plunged into their set technical program.

The public stayed and stayed and kept staying. The medicals braced up, began to talk in language "understanded of the people." They described their triumphs, and also confessed frankly their defeats and errors in human fashion, as though no laymen were in hearing distance. The meeting grew friendly, conversational. Medicals only spoke, but they spoke openly and clearly, baring their breasts to the assembled public. When all was finished, Goodhue county had had an experience unsurpassed in human interest.

Our counsel is that every county medical society try the same plan. Let us show the public that we are men like as they are—let us break down in real good earnest the isolation of the profession from the rest of the world. Combination meetings with the public, using the County Public Health Associations for a nucleus of an audience, will go very far towards better understandings, wider interests, more confidence.

Nor should such meetings be just for public health in its accepted sense. Public health may well furnish the "jump off," but the interest of the public in every phase of medicine is deep and wide and growing. Medicine is no longer a luxury but a real need. The public sees and feels it—they want to know about it. Let the medical profession itself do the teaching—and here is at least one way of doing it; a beginning of our program for developing the "Medicine of the Future."

OF GENERAL INTEREST

Dr. Christian Johnson of Willmar has moved to Everett, Wash.

Dr. L. E. Doolittle has been appointed school physician of Duluth.

Dr. C. L. Hess formerly of Rochester has moved to Bay City, Mich.

Dr. W. A. Bessesen of Albert Lea is planning to move to Minneapolis.

Dr. E. K. Pfaff of Minneapolis has moved to Hendricks to assist Dr. Jensen.

Dr. F. L. Bregel formerly of Fairfax is now serving with the Red Cross in Siberia.

Dr. W. Ray Shannon of Minneapolis conducted a baby clinic in April at Pine City.

Dr. George Stevenson is associated with his father, Dr. G. A. Stevenson, at Albert Lea.

Dr. J. H. Dorsey of Glencoe has returned from Maryland where he spent the winter.

Dr. and Mrs. Portman have returned to Jackson. They have spent the winter in the south.

The Central Interurban Clinical Club met in Minneapolis and Rochester, May 21 and 22.

Dr. Frank Gunn has located in Baudette. He was formerly city physician of Eau Claire, Wis.

Dr. B. S. Bohling of Duluth has gone to Chicago to do special work for the university hospital.

Dr. H. E. McKibben of Hector was married on April 10th to Miss Anna Edstrom of Omaha, Neb.

Dr. and Mrs. G. A. Eisengraeber returned to Granite Falls, having spent the winter in California.

Dr. Harold C. Stratte of Dawson has been appointed interne at the Bellevue Hospital in New York.

Dr. Myron O. Henry of Minneapolis was married April 14th to Miss Lucile Fisher of Minneapolis.

Dr. E. H. Morris of Pittsburgh, Pa., will locate in Austin and become associated with Dr. C. C. Leck.

Dr. G. T. Haugan of Battle Lake will move to Fergus Falls and become associated with Dr. T. N. Kittleson.

Dr. Russell A. Hennessy has returned from service and has again become associated with Dr. Granger of Rochester.

Dr. F. W. Davis of Alden is taking a post graduate course in Chicago. He will specialize in eye, ear, nose and throat work.

Dr. P. S. Epperson formerly of Biwabik, Minnesota, now taking post-graduate work in Chicago, will locate in Aberdeen, S. D.

Dr. Roy Andrews of Mankato has returned from New York and Boston, where he has been taking a post-graduate course in pediatrics.

Dr. L. F. Sutton, field inspector, Minnesota Sanitorium Commission, has gone to Europe to make a study of social conditions in England.

Dr. W. J. Marclay of Minneapolis was chosen one of the directors of the National Tuberculosis Association at the meeting of the association in St. Louis.

Drs. Baker and Burnap of Fergus Falls; have taken into their firm Dr. A. W. Lee, who since his return from France has been practicing in Underwood.

Dr. J. R. Elsey of Glenwood has been appointed medical examiner for the Bureau of War Risk Insurance for the fiscal year ending June 30, 1920.

Dr. J. L. Adams and wife, of Morgan, have gone to California. Dr. B. Flinn of Redwood Falls will look after Dr. Adams' practice while the latter is away.

A Diagnostic X-ray Laboratory has been established at 217 Lowry Bldg., St. Paul, by a number of St. Paul physicians. It is under the supervision of Dr. R. G. Allison.

President Jessup, of the University of Iowa; Dean Seashore, of the Graduate School; and Dean Dean, of the College of Medicine, visited the Mayo Foundation, Monday, May 17.

Dr. Robert Lovett of Boston, Mass., gave a Mayo Foundation Lecture Monday evening, May 3. The subject of the lecture was, "The operative treatment of infantile paralysis."

Dr. T. G. Clement of Amboy has been discharged from the service and will locate in Minneapolis as a specialist on diseases of the lungs. He has been appointed instructor at the University in his special line.

Several shipments of fake sure-cure medicines made in Canada have been refused admission to the country by the Federal Food and Drugs Act. These fakirs seem to die hard and are continuing their bunko game in Canada.

The names of Drs. Cyrus Northrop, Chas. H. Mayo and Wm. J. Mayo appear on the new Board of Electors to the Hall of Fame of New York University. This is a great honor as only most broadminded and representative Americans are chosen.

The New York Association for Medical Education, organized last August, has endorsed the $2,000,000 endowment fund campaign of the Post-graduate Medical School and Hospital. The campaign is well under way and promises to reach the goal set.

The Mankato Clinic announces that Dr. J. T. Schlesselman, limiting his practice to the diseases of the eye, ear, nose and throat and Dr. A. M. Snell, limiting his practice to internal medicine, have associated themselves with the Mankato Clinic.

The Chinese Red Cross Society was formed in 1904 during the Japo-Russian War. Following the war a Chinese Central Red Cross Hospital and Medical College for Chinese Students was established near Shanghai. Instruction is carried on in English and the equipment is up-to-date.

At the last regular meeting of the Stearns-Benton County Society held in April the following officers were elected: President, Dr. W. L. Beebe; vice president, Dr. H. W. Goehrs; secretary-treasurer, Dr. H. B. Clark; board of censors, Dr. J. H. Beaty, Dr. Geo. Sherwood and Dr. W. L. Beebe.

A large part of the article entitled "Prevention and Control of the Venereal Diseases" published in our April issue by Dr. Sherman Lull, was taken from the booklet entitled "Today's World Problem in Diseases Prevention," by John H. Stokes, M. D., of the Mayo Clinic, and quotation marks omitted. In justice to Dr. Stokes attention is called to this fact.

Dr. H. W. Hill, executive secretary of the Minnesota Public Health Association, has been appointed chairman of a special committee of eleven state representatives who will perfect plans for a reorganization of the National Tuberculosis Association. Dr. Hill was reelected chairman of the Sociological Section and chairman of the National Conference of Tuberculosis Secretaries.

In New York City the Board of Ambulance Service has reported a definite decrease in cases of alcoholism. Bellevue Hospital had 228 calls for alcoholic cases in January and February, 1919, and 31 in the same two months in 1920. As a result it is estimated this one hospital will have room for some 7,000 new patients this year. It is interesting to speculate on the total effect of prohibition throughout the country.

Licenses to practice in Minnesota were granted to eighty-eight physicians by the Minnesota State Board of Medical Examiners. Sixty-two of these were graduates of the last class of the University of Minnesota Medical College. The remainder were from other states and medical men of overseas experience. The following were elected on the examining board: President, Dr. A. M. Eastman, Minneapolis; vice president, Dr. Ida A. MacKean, Minneapolis; secretary-treasurer, Dr. Thomas McDavitt, St. Paul.

A staff was organized by the visiting physicians and surgeons of Fairview Hospital on April 28, 1920, at the hospital. The officers elected for the year are Dr. H. L. Williams, president; Dr. Oscar Owre, vice president; Dr. F. J. Souba, secretary-treasurer. Meetings of the staff will be held on the evening of the first Wednesday of each month at the hospital. A program, consisting of papers and clinical case reports, will be a part of each meeting. The first regular meeting was held on May 5, 1920, at the hospital.

Numerous opportunities for physicians are announced by the United States Civil Service Commission. Competitive examinations for bacteriologists and those desiring Panama Canal service are to be held in the near future. Vacancies in the positions of physicians in the Indian Service, acting assistant surgeon in the Public Health Service and in the Coast and Geodetic Survey will be filled from time to time. Those interested may obtain particulars from the Secretary of the United States Civil Service Board, Post Office, St. Paul.

According to the Survey for April 17, 1920, health clinics, under the supervision of the Minnesota Health Association, have been held in nearly all of the eighty-six counties of the State. It was Dr. Walter R. Ramsey of St. Paul, who first suggested the organization of the children specialists throughout the State to give their services to the counties for preventive work. These clinics now include

dental, eye, ear, tuberculosis and obstetrical clinics in addition to the children's clinics. The value of the work can scarcely be overestimated.

The State Board of Health is feeling the pinch which threatens to become a strangle hold of the High Cost of Living. The activities of the board are such that they tend to increase with the growth in population and industrial activities. The recent influenza epidemics have made additional clerical help necessary. With the increase demanded by salaried individuals now comes the necessity of cutting down in number of employes. This means a restriction in the activities of the board. This will be felt most keenly in the divisions of vital statistics and sanitation. Supervisions of pasteurization will temporarfly have to be suspended. A consideration of the budgets for the ensuing year will be taken up at a special meeting of the board in June.

Figures of the war department show that twenty-eight American Red Cross nurses wear the Croix de Guerre of France, two the British Military Medal, fifteen the British Royal Red Cross, first class; and fifty-two the British Royal Red Cross, second class. Sixty-seven have been decorated with the Medaille de la Reconnaissance of France. One nurse wears the Medaille de la Reine, of Belgium, three the Silver Cross of St. Anne of Russia, while the Distinguished Service Cross of the United States, has been conferred upon three others and the Distinguished Service Medal upon two American Red Cross nurses. Sir Douglas Haig's list of mentions for gallant service on the Western Front includes the name of thirteen Yankee nurses; five others have received the British Certificate of Merit, while General Pershing has cited thirty-four for distinguished service and unusual bravery under shell fire.

A special meeting of the general staff of the Mayo Foundation and Clinic was held in honor of the members of the British and French Commission visiting and investigating medical and surgical institutions with a view to determine the possibilities of a more intimate relation between the countries and the establishment of international reciprocity. Dr. Wilson acted as chairman. Dr. Walter L. Biering and Dr. D. A. Strickler, both members of the National Board of Medical Examiners, gave in brief the purpose of the present visit to this country that the two commissions are making. In their remarks Sir Humphrey Rolleston referred to Rochester as the surgical mecca and Colonel Waring, the other member of the British Commission, mentioned that it had been determined to bestow on Dr. C. H. Mayo a fellowship in the Royal College of Surgeons, on July 6th of this year. Professor Roussey of the University of Paris and Professor Desmerest of Paris, and Dr. Norman Walker of Edinburgh, also spoke.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

FLOYD O. WOODWARD,
DONALDSON BLDG., MINNEAPOLIS.

THE RAPIDITY AND PERSISTENCE OF ACTION OF DIGITALIS ON HEARTS SHOWING AURICULAR FIBRILLATION: G. Canby Robinson. (Am. Jour. Med. Sc. Jan., 1920). In order to determine the time required to get the initial effect, the maximum effect and the duration of action of digitalis, twenty-six cases showing auricular fibrillation and auricular flutter were studied and frequent observations of the ventricular rate, radial pulse rate and pulse deficit were made.

The Eggleston method of administering a single large dose of a standardized tincture of digitalis was used. Most of the cases received a dose of fifteen cubic centimeters. Given in repeated small doses, digitalis requires many hours or even days to affect the heart.

In all of the cases observed, the ventricular rate became definitely slowed in two to five hours (initial effect). The disappearance of pulse deficit was taken as showing full digitalization. This effect was obtained at varying lengths of time, the minimum time being six hours and the maximum time twenty-six hours.

In order to determine the duration of digitalis effect from the single large dose, the patients were kept constantly in bed and careful records made of the ventricular and pulse rates. When the heart rate became accelerated and the pulse deficit increased, the drug was considered to have begun to be ineffectual. In this series the digitalis effect lasted from four to fifteen days, averaging nearly ten days.

The persistence of the action of digitalis is of considerable pratical importance. Hatcher has shown that various digitalins vary in their persistence. Cohn, Fraser and Jamison found the duration to vary from five to twenty-two days as determined by the change in the T-wave of the electrocardiogram. Eggleston found four to twelve days the duration and that digitonin and digitalis were rapidly absorbed from the alimentary canal of men. It has been shown experimentally that there is a definite difference in the absorption rates of different digitalis preparations. Haskell, et. al. believes the tincture is better absorbed than the infusion.

Nearly all the cases reported in this series showed very marked clinical improvement within a few

hours after the administration of the drug. It is this rapid and uniform rate of action of the single large dose that commends and justifies its use when the patient is under constant observation in the hospital. The author feels, however, that further studies are required before such large doses as were given to his cases should be recommended for general use.

FLOYD O. WOODWARD.

THE TREATMENT OF HYPERTENSION: Eli Moschcowitz (Am. Jour. Med. Sci., April, 1920.) In a previous paper on hypertension, Moschcowitz advanced his belief that hypertension and hypertensive states are commonly found in individuals of a certain type, having physical and psychical characteristics which typified them. He calls attention particularly to the fact that they are inclined to be overweight, with short necks and slow and unathletic movements, and psychically prematurely old, lacking the ability to play either mentally or physically. Even though we may be at variance with his belief, that hypertension is a primary pathological state due to unknown causes, and that arteriosclerosis and nephritis, particularly the latter, are merely secondary manifestations, yet his ideas concerning treatment are basically sound and worthy of review.

He discusses them under the four headings: Firstly, instructions to the patient; secondly, diet; thirdly, exercise and play; fourthly, drugs.

In his instructions to the patient, he minimizes the significance of high blood pressure as much as possible to the patient, and believes that oftentimes these patients would be better off if they had been told nothing. Extreme tact is necessary. The doctor should teach the patient tactfully the nature and significance of hypertension, and explain its significance. He deprecates the adyice so commonly given that the patient retire from business, and believes that advice to be unsound. On the contrary, he advises patients to stick to their work, probably at times shortening the hours or devolving certain features of the business of a particularly strenuous nature to others. Frequent holidays are advised, and change from the daily routine strongly urged.

In discussing the influence of diet, he thinks that the low protein diet for hypertensive states is unfounded on any experimental or sound empiric evidence, as he has never seen a high protein diet influence the hypertension in any way. If overweight, he believes a reduction in diet advisable, and suggests simple food as fruits, coffee or tea (without sugar), meat, vegetables, salads, and a small amount of bread. When a minimal weight is reached which he thinks proper for the patient, he gradually increases the food to maintain the weight level at that particular point.

Under evercise he advises that rest, strictly speaking, be employed only in the treatment of hypertension when circulatory insufficiency prevails. Otherwise he believes that exercise, particularly in the form of play, is of striking value. Golf he considers the exercise par excellence.

By attaining the minimal weight level with diet and exercise, most of the symptoms are promptly ameliorated. The wind is better, the cardiac reserve increased, and subjective symptoms promptly disappear. He thinks the influence of these factors is more marked on the diastolic pressure than on the systolic, resulting in an increase in pulse pressure.

Rest is of importance in three conditions: In severe circulatory insufficiency, as manifested by decompensatory phenomena; also in the cases of essential hypertension with high pressures and a full bounding pulse and signs premonitory of cerebral hemorrhage. And lastly, in all long standing cases of hypertension with aggravation of all focal organic signs, as severe dyspnea, general enfeeblement, etc. In these cases rest seems to be of distinct value.

Medicinally, he places digitalis at the head of the list, and believes its use is not sufficiently widespread. Digitalis certainly does not increase the blood pressure, and by slowing the heart and enabling the organ to accumulate a greater reserve, it proves of great value. It is countra-indicated when the pulse is slow (between 60 and 70). It is generally understood, of course, how valuable a drug it is in the decompensating stage of any form of hypertension. The nitrites he uses only when he has the so-called "spasm" phenomena, such as anginoid attacks, transient aphasias, headaches, dizziness, etc., but they should be given oftener than three or four times a day, as is the custom. He considers the iodids of little or no use, and is skeptical as to the value of chloral hydrate, thinking that a milder sedative or hypnotic is of more value. Caffein and the theocin derivatives are negligible as far as their effect on the heart is concerned, but they improve the secondary associations of hypertension, and in that way lessen the embarrassment of heart action.

In discussing the possibility of cure, he emphasizes the value of beginning treatment in these cases early, when the pressures are still only nominally elevated. He believes that he has cured a number of cases of persistent hypertension by the use of these methods, not only symptomatically but even objectively, by bringing their pressures back to normal. This is true in the class of cases in which the systolic was not any higher than 170 mm. and the diastolic only a little over 100, and with very little increase in the pulse frequency.

G. J. HIRSCHBOECK.

THE OCCURRENCE OF HYPOCHLORHYDRIA IN GALL BLADDER DISEASE: R. C. Fravel (Am. Jour. Med. Sc., April, 1920) gives the results of gastric analysis in 61 cases of bile tract infection, 49

cases with stones, and 12 cases without stones. In some of the cases the primary operation was for other abdominal conditions and the disease of the gall bladder was found during the course of the operation. The gastric analyses were made by a competent pathologist. The Ewald test meal was used and the (indicators) were Topfer's reagent and phenol-phthalein. Forty-five cases showed a free HCl. reading of less than 20 (in 16 there was a total absence of free HCl.) Eleven cases showed readings within normal limits and only 5 showed hyperacidity. The total acid readings fell below 40 in 39 cases and only in 11 were the readings above 50. These findings do not agree with the generally accepted readings of hyperacidity in cases of gall bladder disease. However other writers such as Hollweg, V. Aldor, Olly, Hernando, Wohl, and Hamburger have found a tendency to subacidity in large percentages of gall bladder disease cases. The author discusses the question of the function of the gall bladder, quoting experimental work and clinical observations especially in regard to the effect of marked disease or absence of the gall bladder on gastric secretions. He believes that the amount of acid produced in the stomach may be taken as an index of the function of the gall bladder. Any function remaining must be preserved during operations if possible. His main purpose, however, is to call attention to the occurrence of low acid values in cases of gall bladder infection, and he proposes to follow another series of cases using the fractional method instead of single analysis.

REUBEN A. JOHNSON.

EARLY ROENTGENOLOGICAL DIAGNOSIS OF ULCERATIVE TUBERCULOUS COLITIS: Lawrason Brown (Am. Jour. Roent., December, 1919) believes that this condition is a much more common complication of pulmonary tuberculosis than is generally recognized, autopsy records on phthisis revealing intestinal lesions in 60 to 80 per cent; the region of the ileo-cecal valve being involved in 85 per cent.

Symptoms: Phthisis cases beginning to do badly without any change in pulmonary signs, slight anorexia, prolonged meteorism, slight abdominal discomfort or actual pain, regurgitation or vomiting of food, constipation or diarrhea, and slight irregular temperature.

Method of X-ray Examination: Patient is given no laxative the day before the examination, eats usual breakfast and reports for examination 6 hours after ingestion of the barium meal. Brown uses the following meal: Barium Sulph. oz. IV. Flour; cocoa; sugar aa one tablespoonful; sweet milk q. s. ad oz. XVI.

Normally after a barium meal the stomach is empty in 3 to 6 hours. Barium first reaches the ileo-cecal valve in 1 to 3 hours and the ileum is empty in 5 to 9 hours. Barium enters the cecum in 2 to 4 hours. Six hours after the ingestion the head of the column is near the splenic flexure (at this time the cecum and ascending colon are well filled and the haustral markings are distinct).

The ascending colon remains filled for from 4 to 14 hours following the ingestion of the meal and in many cases as long as 36 hours. Complete evacuation of the colon takes place usually in 30 to 48 hours.

Pathologic Hypermotility: In cases later proved to have tuberculous ulcerative colitis, the barium is completely eliminated from the bowel in 24 hours. Closer examination shows that the cecum, ascending colon and other portions of the colon refused to retain the barium to their full capacity, but tended to discharge it rapidly. When the barium was held, the shadows were irregular and ragged in outline, and (watched under the screen) as soon as the barium was seen to approach this area, it was largely or completely passed on.

Another type: Instead of the cecum being filled, no barium had passed the ileo-cecal valve even though the stomach was empty (i.. e., increased tone of the cecum prevented the ileum from emptying) all the meal being seen in the terminal ileum. A later examination might reveal the head of the column in the middle of the transverse colon, and at the end of 24 hours the bowel be entirely empty, or the entire meal be in the sigmoid and rectum.

Filling defects—common in ulcerative tuberculous colitis—bowel has a ragged outline. Hypermotility due to other causes (i. e., castor oil)—this shows an increased motility in the colon—**but no ragged outline;** furthermore, the tendency of the ascending colon is to retain the barium a reasonable length of time.

Habitual diarrhea,—no definite filling defects simply a rapid emptying of the bowel, it sometimes being completely empty in less than 24 hours.

Further study with the barium enema: the material enters the colon in an unbroken column until it reaches the diseased portion where it may be held up temporarily, when increase in gravity or slight manipulation will overcome the resistance. The enema fills the diseased portion slowly and very irregularly. It seems as though the bowel were in a state of spasm and the enema found difficulty in gaining entrance. However, it would eventually fill, only to be forced out a few seconds later by spasm of this portion of the colon. In all cases showing the above manifestations which came to operation or autopsy cecal ulceration (tuberculous) was found.

Diagnostic fluoroscopic findings were (1) hyermotility, (2) cecal filling defects.

Discussion of the paper brought out the fact that irritability of the colon must be constant and emptying of the diseased portion constant before tuberculous ulceration can be diagnosed.

C. N. HENSEL.

SURGERY

SUPERVISORS:
WALLACE H. COLE,
LOWRY BLDG., ST. PAUL.
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER.

AN EXPERIMENTAL STUDY OF URETERAL LIGATION; DEMONSTRATION OF LATE RESULTS TO URETER AND KIDNEY: John R. Caulk, and R. F. Fischer, (Surg., Gyn. and Ob., April, 1920.) This study was made after observation upon a patient in whom both ureters were ligated during a hysterectomy, for fibroids. There was no urine for eight days when double nephrostomy was done. On the fifty-eighth day the patient voided and ten days later the urine was all passed by the bladder and the nephrostomy wounds healed. The patient is in excellent health and the renal function has returned to normal.

The authors confine themselves strictly to ligations of the ureter and not to severence. The experiments were done entirely on dogs. The authors endeavored to determine (1) the time necessary for the absorption of No. 2 plain catgut, (2) if the ureter after ligation would finally open, (3) the manner in which this opening occurred, (4) the length of time for it to open, and (5) the renal complication at various intervals following sudden occlusion of the ureter.

The experiments showed that No. 2 plain catgut was never absorbed before the end of three weeks, consequently in cases of double ligation before death of the patient or in single ligation destruction of the kidney, deligation, ureterovesical anastomosis or nephostomy must be adopted. Deligation is difficult and ureterovesical anastomoses are not entirely satisfactory. After ligation of a ureter the first indication of a lumen through the site of ligation occurred at the fifth week which had opened up sufficiently by the sixth week to allow fluids to be injected through. At the end of eight weeks the ureteral lumen is fairly well open being somewhat restricted at the site of ligation which is more apparent than real. At twelve weeks there is less constriction. The authors' studies lead them to believe that strictures of the ureter are not as frequent as is usually supposed, but that the majority of them are spasms in the neighborhood of inflammatory processes.

Dilatation of the ureter and kidney pelvis starts fairly promptly after ligation. To conserve the kidney the obstruction must be removed within two weeks.

The blood nitrogen showed a rise in some animals with single ligation. Drainage was done usually on the fourth day with drop to normal of blood nitrogen in form two to four days.

The authors conclude that catgut will not be absorbed rapidly enough to protect a kidney against complete destruction. A ureter ligated with catgut will open sufficiently in from six to eight weeks to allow complete drainage. V. C. HUNT.

GASTRO-ENTEROSTOMY STILL THE TREATMENT FOR CHRONIC GASTRIC AND DUODENAL ULCER: R. C. Coffee, (Ann. Surg., 1920, Vol. 71, p. 303.) The author discusses the following points in his paper: 1. Immediate danger from the operation. 2. Subsequent dangers associated with the results of the operation. 3. Amount of final relief of morbidity. 4. Life expectancy after operation.

The paper is based on 233 patients with gastro-duodenal ulcer operated on by him from April, 1904 to October, 1919. There were ten deaths, a mortality of 4.33 per cent. Two patients died from hemorrhage, one of shock, one of pneumonia, one of empyema, one of dilatation of the stomach, two of anuria, probably uremia, and two of angulation of the intestine, probably obstruction.

Secondary or recurring, either at the point of excision or a new place, ulcers occurred in nine cases (3.8 per cent) of the entire series. Two of these followed simple gastro-enterostomy. In eight sleeve resections there was a recurrence of the ulcer in two. In eleven cases of excision of the ulcer by knife or Balfour cautery, without gastro-enterostomy, a recurrence occurred in three. In twenty-two von Eiselsberg exclusion operations secondary ulcers developed in two while in 165 simple gastro-enterostomies ulcers have been known to develop only in two.

Severe hemorrhage at a remote period following operation occurred in three cases, only one in 165 simple gastro-enterostomies, and two in twenty-two von Eiselsberg operations. Of the 233 patients operated on for ulcer of the stomach or duodenum, four have been known to have developed cancer; one of these was in the group of 165 cases of simple gastro-enterostomy.

The simple gastro-enterostomies in this series shows a mortality of four in 165 cases (2.42 per cent) all other operations combined, sixty-seven cases, shows an immediate mortality of 9 per cent. . All the evidence indicates that simple gastro-enterostomy gives better results from the standpoint of recovery than any radical operations.

The author recommends a gastro-enterostomy and awaiting results; with a radical excision later if trouble develops. V. C. HUNT.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
ARCHIBALD L. McDONALD,
FIDELITY BLDG., DULUTH.
ALBERT G. SCHULZE,
LOWRY BLDG., ST. PAUL.

THE LETTSOMIAN LECTURE ON TUMORS COMPLICATING PREGNANCY, LABOR AND THE PUERPERIUM: Herbert R. Spencer, (Brit. Med. Jour., Feb. 7, 1920.) The lecture is based on 37 cases.

Eight illustrate the fact that in cases of small tumors, and even in case of some as large as an adult's head, no difficulty will be encountered during pregnancy and labor. One case illustrated the proneness of pedunculated reniform tumors to rotate, and cause inflammation. Several cases show instances of retroversion, retroflexion, acute anteflexion and inversion of the uterus caused by tumors. Several sub-mucous tumors were removed through the cervix after delivery or miscarriage; hysterectomy was not necessary.

Three fatal cases were in the series, one from injury to the bowel caused by two fibroids; one from a twisted and infected reniform tumor and the third from sepsis following cesarean section in case of infection.

Fibroids occur about once in 150 pregnancies.

It has been suggested that fibroids might be congenital but examination of the uteri of 100 stillborn females failed to reveal any tumors. They are practically unknown before puberty, and rare before 25 years and Bayle in 1813 stated "that they were present in nearly every woman over 40 who had preserved the physical signs of virginity". There is reason to believe that sterility favors their growth and that child bearing and suckling, to an extent, prevent their occurrence.

During pregnancy fibroids often increase in size due to edema, hyperplasia and hypertrophy; sometimes they remain stationary, sometimes they reduce in size. They may become softer, may change their shape, may become more prominent, and they may become fixed in the pelvis by impaction or inflammation due to infection or degeneration. A degenerated fibroid may be sterile. The author found an abscess of pure streptococci in the center of a fibroid in a virgin whose only symptom was a cachexia. He suggests that infection might be hematogenous in origin. The vagina may be the route of infection of sub-mucous fibroids.

After labor some tumors may entirely disappear.

Ectopic pregnancy is seldom met with as a complication of fibroids, but post-partum hemorrhage occurs with unusual frequency, although the latter condition may be mistaken for hemorrahge due to submucous fibroids or the insertion of the placenta on a tumor. The sub-mucous form only is apt to cause abortion.

Pain and tenderness may develop over a tumor but the author has never encountered a case of "unbearable pain" which some observers claim justifies hysterectomy in early pregnancy. Torsion and infection produce acute symptoms and call for immediate surgical intervention.

Signs of pressure, such as edema, may arise; malpresentations are frequent; labor may be surprisingly easy, as tumors originally found at the brim are often drawn high up; forceps may be needed for inertia; retained placenta may occur and post-partum hemorrhage may be severe.

The diagnosis of pregnancy and of fibroids is not easy and the difficulty is increased if both conditions exist. In case of pregnancy during the earlier months the diagnosis is made by suppression of menses, a uterus larger than should be, together with hard irregularities. Later in pregnancy the certain signs are available. The tumor remains hard, the uterus soft and contractile; fibroids do not change position as fetal parts do and they become more marked during a uterine contraction while fetal parts are lost. Tumors show a slight mobility with a tendency to return to their former place. In case of twisted fibroid, the hardness of the tumor and the age of the patient must be kept in mind and examination under anesthesia may be necessary.

After delivery, owing to laxity of the abdominal wall, sub-peritoneal and intramural fibroids are more easily diagnosed. A submucous fibroid should be suspected in case of retained placenta, post-partum hemorrhage, a uterus remaining large and hard, and a fever which may be due to retention of the products of conception or infection of the tumor. A differential diagnosis must be made between a tumor and retroflexion; a cystic tumor and an ovarian cyst; a tumor and an inverted uterus.

Prognosis is good in a great majority of the cases if handled with judgment and due attention paid to a sepsis.

Most cases require only careful prenatal supervision, with rest, aperients and anodynes if the growth becomes painful. Induction of abortion and premature labor, and forceful forceps delivery past obstructing tumors are contraindicated, although forceps may be used to overcome an inertia. Craniotomy may be done if the fetus is dead and the mother not infected.

Vaginal myomectomy may be done in case of a cervical tumor. Abdominal myomectomy is rarely called for except in case of large, twisted or necrobiotic tumors. The operation often leads to abortion and often calls for a hysterectomy to control the hemorrhage from the bed of the tumor. Before myomectomy and cesarean section if the tumor proves to be infected, a hysterectomy should be done.

Hysterectomy in early pregnancy, except in case of hemorrhage and infection, is rarely called for. "The practice of hysterectomy in the early months of pregnancy is, in my opinion, much too common, both abroad and in this country. I have never found it necessary."

Every endeavor should be made to allow pregnancy to continue to the time of viability. Conservative cesarean section is rarely indicated for fibroids only, but may be done when that condition is associated with mal-presentation and contracted pelvis.

The author then presents three tables; one of five cases of abdominal myomectomy, one of six cases of conservative cesarean section and one of

five cases of cesarean section followed by abdominal hysterectomy.

ALBERT G. SCHULZE.

TREATMENT OF THE SEVERE VOMITING OF EARLY PREGNANCY: Frank W. Lynch (J. A. M. A., Vol. 73, No. 7.) It is assumed that the mother is in some way sensitized to vomiting since this occurs so often in cases where no ordinary cause is present. Pathology shows changes in the liver, cloudy swelling or characteristic lesions in the lobule, which are present in all fatal cases. The distinction between the "Reflex-neurotic" and "Toxic" types is not absolute, but fatal cases of either form show more or less definite change in the liver lobule. The relationship of the Nitrogen Metabolism and Ammonia Coefficient in these cases is substantiated by Lynch's observations with certain reservations. It is best to state actual amounts of the ammonia nitrogen content of the urine rather than per cent. Recognize that this is influenced by diet, medication, and body weight. An acidosis as determined by the CO_2 tension is common in normal pregnancy and is not increased in case of severe vomiting. Ammonia nitrogen may be somewhat increased in mild cases of vomiting, but all patients whose condition was critical, judged clinically, showed a high ammonia content. This may also be seen in cases of starvation but never approaching the degree shown in toxic vomiting. Conclusive evidence is shown in vomiting cases under Lynch's observation with a high ammonia content, which returned to normal under treatment, with preservation of the pregnancy.

Treatment of toxic vomiting presupposes an exclusion of any local cause. It requires rest, proper hygiene, few drugs, relief of constipation by diet and high colonic flushings. Minute attention to diet, withholding food by mouth till there is no vomiting for 24 hours. Sodium bromide in large doses and glucose and sodium bicarbonate by rectum. Then small amounts of solid food: meats, twice toasted bread, butter, and cream, no fluids especially with meals. Bromides are gradually reduced, and are replaced by magnesia and soda by mouth. Gastric lavage is seldom helpful. Fulminating or progressive cases or those with black vomit, or with persistent high ammonia content should be aborted. He has had no results with normal pregnant serum, epinepherin, or corpus luteum. Uterus should be emptied by simplest method, since this may cause death. Chloroform is contra-indicated, ether is also objectionable. He prefers local anasthesia supplemented by nitrous oxide to twilight stage. If dilatation with Hegar's dilators is not sufficient, vaginal hysterotomy is best. Bags or packing are likely to increase symptoms and are more liable to be followed by infection.

ARCHIBALD L. MCDONALD.

PEDIATRICS

SUPERVISORS:
FREDERICK C. RODDA,
SYNDICATE BLDG., MINNEAPOLIS.
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO.

STUDIES WITH A NEW METHOD FOR DETERMINING THE COAGULATION TIME OF THE BLOOD IN THE NEW-BORN: F. C. Rodda (Am. Jour. Dis. of Child., April, 1920.) The apparatus required consists of a spring lance, two, one and one-half inch watch glasses and a No. 6 lead shot, all of which are easily obtained. Glass and shot should be cleansed, soap and water followed with alcohol and ether. The heel of the infant is sponged with ether and a puncture is made sufficient to produce a free flow of blood without the slightest pressure. The watch glass containing the No. 6 shot receives the second drop of blood. A second watch glass is inverted over the first. They are gently tilted every thirty seconds until the shot no longer rolls but is fixed in the clot. The end-result is sharply defined, the shot is firmly embedded, so the glass may be inverted without dislodgment of the shot. The method is simple and easily applied. The average coagulation time in the new-born with the method is seven minutes, with a normal range of from five to nine or even ten minutes. The average bleeding time in the new-born with Duke's method is three and one-half minutes with a normal range of from two to five minutes. In the normal new-born there is found a tendency to prolongation of these times in the first days of life. Hemorrhage is accompanied, in many cases at least, with an exaggeration of this tendency or markedly prolonged coagulation and bleeding times. The coagulation and bleeding times should be studied in conjunction.

Routine determinations in the new-born will allow the selection of at least certain of the hemorrhagic conditions before the onset of symptoms and give the indications for the administration of blood. The method will allow of a check on therapy in hemorrhages of the new-born.

ROY N. ANDREWS.

APPEARANCE OF ISOAGGLUTININS IN INFANTS AND CHILDREN: W. M. Happ (Jour. Exp. Med., Vol. 31, p. 313) tested the serum and washed corpuscles of 131 infants and children against the serum and corpuscles of all four human blood groups. His work extended over a period of five years and he was able to retest the blood of various children as they grew older.

He found that isoagglutination is rarely present during the first month, but that in most infants the blood group was definitely established at the end of one year and that it was completely established in all cases by the end of the second year. The corpuscles acquire agglutinophilic receptors before

the serum acquires agglutinin. Usually from birth on the cells are agglutinable although the infant's serum may not possess agglutinin until later. Once the group is established it appears to be permanent.

Isoagglutinins are present in the mother's milk; but apparently are not transmitted to the infant, whose blood is often in a group antagonistic to his mother's. Hence Happ concludes that it is not safe to transfuse an infant from its mother without making preliminary tests. ROOD TAYLOR.

THE PROBLEM OF THE PREMATURE INFANT: John F. Sinclair (Arch. Ped., March, 1920), gives clear, minute directions for proper premature care. The secret of success he points out in the opening paragraph, "The premature infant presents certain problems which must be met promptly and with minute attention to detail. Indeed, success in treatment depends largely on the care and treatment which the infant receives from the moment of its birth and the scrupulous and exact carrying out of every detail".

Discussion falls under 3 heads.

(1) Maintenance of body heat which involves protection from chilling immediately after delivery, proper clothing and a suitable container or basket. The basket prepared as directed (is superior to any nickelplated incubator) may be readily provided in the average home. The basket temperature and the humidity are closely controlled by thermometer and hygrometer. Though a basket temperature of 80° is often optimum some infants will require more heat, others less.

(2) Isolation of the infant is extremely important since the premature is especially susceptible to respiratory infections.

(3) Feeding is very important; breast milk should be insisted upon, but formulae for artificial feeding are given. The quantity given by Breck feeder or gavage is proportionately much more than required by the full term new-born. The interval between feedings he feels should be elastic.

He points out the tendency of the premature to deficiencies of certain mineral salts, as iron, phosphorus and calcium, and recommends the early administration of these drugs as prophylaxis for rickets and anemia. FREDERICK C. RODDA.

ROENTGENOLOGY

SUPERVISORS:

C. U. DESJARDINS,
MAYO CLINIC, ROCHESTER.

R. G. ALLISON,
SYNDICATE BLDG., MINNEAPOLIS.

ROLE OF THE X-RAY IN DIAGNOSIS OF LONG-STANDING RENAL TUBERCULOSIS: J. Colston and C. Waters, (Johns-Hopkins Hosp. Bul., September, 1919.) That systoscopy and ureteral catheterization will show most renal tuberculosis is granted by Colston and Waters, but there are two classes of cases where the X-ray is invaluable: First, where catheterization is impossible on account of changes in the bladder mucosa. Second, in cases with chronic tuberculosis of the kidney with sluggish ulceration and absence of tubercle baccili in the urine.

The shadows vary from a small indefinite shadow case by a calcified tuberculous area about a calyx, to the lobulated shadow of a kidney consisting entirely of calcified abscess cavities.

Where the involvement is extreme the condition is not difficult to recognize but when early the area must be carefully differentiated from renal calculus, calcified glands, and gall-stones.

R. G. ALLISON.

FLUOROSCOPIC EXAMINATION IN INJURIES OF THE HEAD: M. William Clift (Am. Jour. Ront., March, 1920), believes that fluoroscopy of the head, while it cannot replace stereorontgenography in the study of certain head conditions, can be made to yield much information in connection with the presehce of intracranial foreign bodies, the accessory sinuses and jaw, as well as in foreign bodies in the orbit, as a preliminary to localization. The use of a small radiator-type Coolidge tube is advocated; the tube working on a five-inch gap with a current of from three to five ma.

By adopting a routine method the skull may be gone over quickly and without prolonging the radiation beyond the limits of safety. CRANIUM—The patient is placed in the dorsal position, face upward. The observer grasps the head with his right hand and rotates it slowly to the right 90°, using a small diaphragm. When the head reaches the lateral position, the diaphragm is opened for a general survey of the cranium as a whole. The head is now brought back through an arc of 180° to the opposite lateral aspect and back to its original position. ACCESSORY SINUSES—The frontal sinuses and anterior ethmoids are now examined in the antero-posterior position. With his right hand beneath the occiput the operator raises the head until the great wings of the sphenoid no longer obstruct the view of the antrum. Fluid or foreign bodies, according to the author, are easily determined. EYE—In searching for foreign bodies in the orbit, the head is turned so as to bring the injured eye nearest the screen. The patient is directed to look up and down, the foreign body shadow moving with the eyeball. FOREIGN BODIES—The surgeon wants to know if (1) the skull has been penetrated, and the extent and nature of the fracture; (2) if the dura has been penetrated; (3) if a foreign body is present, its size, its location in reference to the wound tract, and its depth. Inasmuch as the path of a foreign body in the brain is fairly straight, if the head is rotated until the vertical ray passes through both the wound and the foreign body, the

observer is looking down the tract. The author prefers the Roussell method for determining the depth of a foreign body; and to locate a foreign body in relation to important cerebral structures has adopted the use of a cross-section anatomy with a celluloid key-plate showing a lateral view of the skull with the anatomical sections indicated. This he uses directly on the screen, and, having determined the depth of the foreign body, its exact location is quickly found by consulting the appropriate anatomical section.

In discussing operative guides, the author refers to the intermittent control method of Ledoux-Lebard, and states that its greatest value lies in those cases in which the surgeon has had difficulty in extracting the foreign body or in which its position is near some important structure. He explains that the Hirtz compas is not a localizing instrument, but strictly a surgical guide, and that as modified by Hirtz and Gallot it is so simple that it can be used in the most advanced hospitals. In cerebral foreign bodies the electromagnet of Beclere is mentioned; applied in the usual way, the obturator is then passed through the trephine opening and plunged into the brain to the foreign body. The magnet is then attached to the obturator, which, slowly withdrawn, brings with it the projectile. It is only applicable, however, when the foreign body is magnetizable.

A. U. DESJARDINS.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Surgical Shock. Crile and Lower. W. B. Saunders Co., 1920. $5.00.

Pasteur. Dudoux. W. B. Saunders Co., 1920. $5.00.

Diseases of Women. Green. W. M. Leonard, 1920. $6.00.

Diseases of Rectum. Hirschman. C. V. Mosby Co. 1920. $5.00.

Sex Attraction. Vaughan. C. V. Mosby Co., 1920. $ .50.

Personal Beauty and Racial Betterment. Dunlap. C. V. Mosby Co., 1920. $1.00.

Standard Nomenclature of Diseases and Pathological Conditions, Injuries and Poisonings, 1919. Department of Commerce, Washington, D. C.

Arteriosclerosis and Hypertension. Warfield. 1920. C. V. Mosby Co. $4.00.

Diseases of Chest. Norris and Landis. W. B. Saunders Co., 1920. $8.00.

SYSTEMATIC DEVELOPMENT OF X-RAY PLATES AND FILMS. L. Wendell, B. S., D. D. S. C. V. Mosby Co., 1919. $2.00.

This is a very instructive little volume on the development of x-ray plates and films and the making of lantern slides.

The various methods of development are discussed and compared. Special emphasis is placed on the advantages of a strictly time development, even though this result in a plate much too thin or too dense, as only in this way can all the detail be brought out. The proper general density is then obtained by intensification or reduction if improper exposure should make this necessary.

With its reproductions of radiographs showing the effects of correct and incorrect development, as well as the descriptions and pictures of equipment, this book should be of considerable help to those responsible for this part of the work.

EDWARD SCHONS.

AFTER TREATMENT OF SURGICAL PATIENTS. Bartlett. Vol. I and II. C. V. Mosby. $10.00.

In these two volumes, Bartlett and collaborators have summed up post-operative treatment in its minutest details. This exhaustive work covers both immediate pre-operative and post-operative care. Many small details, that promote the patients' comfort, such as a post-operative recovery room, the minor details of transporting the anesthetized patient, etc., are presented in a very clear and concise manner with an abundance of illustrations.

Volume II covers the treatment of sequelae of the so-called major cases.

As a whole, this work presents innumerable important details which the busy surgeon tends to overlook. These two volumes deserve due consideration of any surgeon.

C. K. WILLIAMS.

AMERICAN ILLUSTRATED MEDICAL DICTIONARY. By W. A. Newman Dorland, A. M., M. D., F. A. C. S. Tenth edition.

This book needs no introduction to the medical profession. It is not intended to make the work an encyclopedia but rather a concise and convenient word-book with such collateral information as might be sought by the busy medical man. The book is amply illustrated and gives in tabulated form such prepared tables as Stains and Staining Methods, Methods of Treatment, Tests, etc. The work is in every way commendable.

Office, well furnished, for physician for rent in the most up-to-date office building in Minneapolis; any hours from early morning until 1:00 p. m. Address **A. N. N., Minnesota Medicine.**

WANTED

Assistantship or association with physician or surgeon in St. Paul or suburbs by experienced young physician. Class A graduate. Will consider locum tenens work. Address A. B. C., care Minnesota Medicine.